

ELİF BÜRÜMLÜ KISA MATERNAL DISCOURSE STYLES IN THE STORYTELLING AND REMINISCING
CONTEXTS IN RELATION TO PRESCHOOLERS' PERSPECTIVE-TAKING ABILITIES Bilkent University 2023

MATERNAL DISCOURSE STYLES IN THE
STORYTELLING AND REMINISCING
CONTEXTS IN RELATION TO PRESCHOOLERS'
PERSPECTIVE-TAKING ABILITIES

A Ph.D. Dissertation

by
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To those I am grateful to every day



MATERNAL DISCOURSE STYLES IN THE STORYTELLING AND
REMINISCING CONTEXTS IN RELATION TO PRESCHOOLERS' PERSPECTIVE-
TAKING ABILITIES

The Graduate School of Economics and Social Sciences of
İhsan Doğramacı Bilkent University

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ABSTRACT

MATERNAL DISCOURSE STYLES IN THE STORYTELLING AND REMINISCING CONTEXTS IN RELATION TO PRESCHOOLERS' PERSPECTIVE- TAKING ABILITIES

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This thesis aimed to investigate a) whether Turkish-speaking mothers adopt distinct discourse styles across two common daily narrative contexts of storytelling and reminiscing? b) whether and how mothers' discourse styles in each context would be associated with children's visual, socio-cognitive, and syntactic perspective-taking (PT) abilities? One-hundred twenty mothers and their 3- to 5-year-old children participated in all study sessions. Each mother-child dyad was asked to narrate a wordless storybook and converse about a shared and specific event they experienced in the lab ('Treasure Hunt' game). Children's vocabulary and perspective-taking abilities (visual PT, false belief understanding, comprehension of syntactic complementation) were assessed. Cluster analyses indicated two distinct styles of mothers when they narrated a storybook with their children (*storytellers*, *story builders*), whereas three styles of mothers were found when

the same mothers talked about their Treasure Hunt memory (*co-teller*, *elicitor*, *constructor*). Maternal education, as well as children's age and verbal contributions, were shown to play a significant role in mothers' assuming a discourse style depending on the context. Children of *storytellers* scored higher in both visual and syntactic PT tasks than children of *story builders*. Children of memory *elicitors* also outperformed children of memory *co-tellers* in visual PT tasks. Implications and future directions are discussed within the sociocultural view that argues for the individually and contextually sensitive nature of maternal narrative scaffolding for preschoolers' social understanding.

Keywords: Maternal discourse, storytelling styles, reminiscing styles, perspective-taking, false belief understanding



ÖZET

HİKAYE ANLATIMI VE ANI KONUŞMASI BAĞLAMLARINDA ANNELERİN ANLATI STİLLERİ VE OKUL ÖNCESİ DÖNEMDEKİ ÇOCUKLARIN BAKIŞ AÇISI ALMA BECERİLERİ İLE İLİŞKİSİ

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Bu çalışma a) Türkçe konuşan annelerin günlük yaşamda çocuklarıyla birlikte sıklıkla dahil oldukları hikaye anlatımı ve anılar hakkındaki konuşmalarında belirgin bir söylem stilini benimseyip benimsemediklerini, b) annelerin bu bağlamlardaki söylem stillerinin çocukların görsel, sosyal-bilişsel ve sözdizimsel akış açısı alma yetenekleri ile olan ilişkisini sosyokültürel bir bakış açısıyla incelemeyi hedeflemiştir. Çalışmanın tüm seanslarına katılan 120 anne ve 3- ile 5-yaş aralığındaki çocukları son örnekleme dahil edilmiştir. Her anne-çocuk çiftinden yazısız bir hikaye kitabını anlatmaları ve laboratuvarında birlikte deneyimledikleri belirli bir olay hakkında (‘Define Avı’ oyunu) konuşmaları istenmiştir. Çocukların kelime dağarcığı ve bakış açısı alma ile ilgili bir dizi yetenekleri (görsel bakış açısı alma, yanlış kanı anlama, sözdizimsel tümleme) ölçülmüştür. Küme analizleri sonuçlarına göre; anne-çocuk hikaye anlatımı sırasında farklı söylem stilini benimseyen iki grup anne bulunurken (*hikaye anlatıcılar*, *hikaye oluşturucular*), aynı anneler çocuklarıyla birlikte geçmiş deneyimleri hakkında

konusurken farklı söylem stillerine sahip üç grup anne bulunmuştur (*anı anlatıcılar, anı anlattıranlar, anı oluşturunucular*). Annelerin hikaye anlatma stillerinin çocukların yaşına göre, anı paylaşımı stillerinin de kendi eğitim seviyelerine göre farklılık gösterdiği bulunmuştur. *Hikaye anlatıcıların* çocukları hem görsel hem de sentaktik bakış açısı alma görevlerinde *hikaye oluşturunucuların* çocuklarından daha iyi performans göstermiştir. *Anı anlattıranların* çocukları ise *anı anlatıcılarının* çocuklarından görsel bakış açısı alma görevinde daha başarılı bulunmuştur. Çalışmanın sonuçları, bireye ve bağlama duyarlı anne anlatı stillerinin okul öncesi dönemdeki çocukların sosyal-bilişsel anlayışları üzerindeki rolü açısından tartışılarak, gelecek çalışma ve uygulamalar için çıkarımlarından bahsedilmiştir.

Anahtar Kelimeler: Anne söylemi, hikaye anlatımı stili, anı paylaşma stili, bakış açısı alma, yanlış kanı

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CHAPTER 1

INTRODUCTION

1.1 Overview

The current study aimed to explore maternal discourse styles in mother-child storytelling and reminiscing conversations and to examine whether mothers' discourse styles in these narrative contexts were related to their preschool-aged children's perspective-related social understanding. From a sociocultural approach, children's understanding of their own and others' perspectives is constructed within early verbal interactions in their family context (Bruner, 1990; Nelson, 1996; Vygotsky, 1987). While children, as listeners or tellers, actively engage in daily parent-child conversations about fictional or personal narratives, parents help their young and inexperienced children by providing them with verbal scaffolding for their symbolic construction of objects, time, self, and others. In other words, through narrative interactions in which both event information and personal views are exchanged between conversation parties, parents verbally lead and encourage their children to think and represent different perspectives. This, in turn, aids children to develop a *social understanding*; that is to appreciate their own perspective within time and in relation to others' (Carpendale & Lewis, 2021; Nelson, 2007).

Given their high rate of accessibility and functionality in daily life, storytelling (i.e., narrating a storybook) and reminiscing (i.e., talking about past experiences) are the most frequent narrative contexts that parents and children are involved with during preschool years. Previous work on both narrative contexts showed individual variability in maternal discourse, based on the degree of how much new information or personal view they put into the relevant discourse, or *elaboration* (e.g., Reese & Fivush, 1993). One line of research suggests that in addition to how mothers are elaborative in narrative exchanges, they also differ in terms of how they use the form of elaborations (requests or provisions) and conversational elements (e.g., evaluations of child responses) (e.g., Carmiol et al., 2022; Melzi et al., 2011). These interactive discourse features are distinctive, in determining both mothers' and children's participation roles in narrative interactions. In contribution to these culturally limited findings, the first aim of the current study was to explore Turkish-speaking mothers' both storytelling and reminiscing styles regarding their comprehensive array of discourse features.

The extant literature that takes a sociocultural approach to children's development of social understanding has indicated significant and positive relations between maternal elaborative styles and children's perspective-taking (PT) abilities (e.g., Reese & Cleveland, 2006; Ontai & Thompson, 2008). Specifically, children whose mothers had frequent use of elaboration (i.e., adopted a more elaborative style) were found to show better comprehension of different perspectives than the children whose mothers were less elaborative during narrative interactions. Besides mothers' level of elaboration, the current study also suggests interactive features of maternal discourse as a potential contributor to children's perspectival understanding. Since mothers' interactive discourse features are likely to prompt children's verbal and cognitive engagement in these conversations, mothers' interactive discourse styles would significantly contribute to their children's PT abilities (i.e., visual PT, syntactic PT, socio-cognitive or epistemic PT). Additionally, it is worthwhile to examine this relation within different daily narrative contexts in contribution to both academic findings and real-life implications. In the next section, the role of parent-child narrative interactions on children's cognitive and social understanding is discussed.

1.2 The role of parent-child narrative interactions on preschoolers' social understanding

As a common mode of daily discourse, parents and children frequently engage in narratives to communicate either fictional (i.e., unreal or imaginary) or personal (i.e., personally experienced, real) events through storytelling and reminiscing conversations. These narratives enable children to experience a symbolic world in which the embodied experiences are linguistically reflected and shared with others. From a sociocultural perspective, parent-child narrative interactions play a constructive role in children's cognitive processes (Bruner, 1986; Labov & Waletzky 1967). Harboring both action (i.e., event setting such as people, time, and place) and consciousness (i.e., narrators'/characters' internal states and personal evaluations) levels, narratives help children to organize and represent patterns of events by providing them with an understanding of the person and mind, as well as their interplay with physical reality.

Contemporary social-constructivist or sociocultural approaches similarly suggest foundational effects of verbal interactions on children's development of the social mind. The social world in which children are born aids the ability to use language as a communication and reasoning tool to make meaning of symbolic thought and belief systems (Carpendale & Lewis, 2021; Fernyhough, 2008; Nelson, 1996; 2007). However, the essence of this cognitive achievement features being aware of and reflecting on the *self* in these interactions, which is beyond pure exposure. Human infants become gradually able to understand the world containing different minds through reciprocal relationships with their social environment rather than just in response to environmental stimuli. In this vein, it is essential to inspect children's engagement in verbal interactions as active agents who are in the process of developing their understanding of the mind.

According to Nelson (1996; 2005; 2007), the preschool years constitute a ground tile for the collaborative process of children's co-construction of the mind. During these years, children acquire their own life story consisting of chronologically structured memories about significant life events; that is, develop their autobiographical memory system (Tulving, 2002). In this process, each event that is experienced and shared with others presents rich input to mentally construct. By integrating personal views and evaluations

into these events, children can create enduring and comprehensive personal histories. These interpretations are built on constructing an understanding and differentiation of the self in time and in relation to others (Fivush, 2011; Pillemer, 1998). In this sense, parent-child early narrative routines including reminiscing and storytelling conversations, provide children with a source of multiple perspectives contrasting self and others. Through these conversations, parental talk in which they stimulate event-related information and evaluations to discuss also supports children's ability to simultaneously represent different perspectives and contrast them with a sense of self situated within time and in relation to others (Carpendale & Lewis, 2021; Nelson, 2007).).

While considering parent-child narratives as a verbal ground for children's social understanding, parental talk is placed at the center of these interactions. As more competent and experienced conversation partners, parents are naturally able to direct their young and inexperienced children. In order to establish quality and useful daily communication with their children, parents can provide a sensitive way of scaffolding by adjusting their child-directed language according to child, familial, and contextual characteristics (e.g., Haden, 1998; Hoff-Ginsberg, 1991). Thus, the current study first discusses individual variability in parents' patterns of discourse across parent-child storytelling and reminiscing contexts. Following differences in parental talk, the ways in which parents' discourse features or styles in these particular contexts could contribute to within children's social understanding are discussed.

1.3 The features of maternal discourse in mother-child narrative conversations

The extant research on children's narrative discourse with their parents, usually with mothers, has investigated the use of *elaborations*. As one of the key discourse features, it refers to the number of new information units that mothers contributed to the narrative conversation about the event specifics or personal evaluations of the narrator or characters (Farrant & Reese, 2000; Reese & Fivush, 1993). Mothers show individual differences in the degree to which they elaborate during storytelling (e.g., Haden et al., 1996) and reminiscing conversations with their children (e.g., Sahin-Acar & Leichtman, 2015). In addition to their individual contributions; the extant literature has also

highlighted variances in how mothers reciprocate their children's contributions to the narrative exchange (e.g., Carmiol et al., 2022; Melzi et al., 2011). Accordingly, mothers might vary in their interactivity which refers their use of different forms of elaboration (i.e., requesting or providing information), and their use of other discourse features that facilitate the flow of the narrative exchange (e.g., evaluations of children's responses, associative talk, repetitions).

Given that mother-child storytelling and reminiscing conversations are both inherently social and shared, it is meaningful to investigate mothers' discourse styles with a comprehensive set of their discourse features. Despite the nuances in content and pragmatics, storytelling and reminiscing are comparable contexts in terms of structure (i.e., causally and temporally-related event depictions) and children's accessibility. In this respect, most research on mother-child narratives has been conducted in these two contexts. Findings on mothers' discourse styles are separately discussed for each context in the following sections.

1.3.1 Maternal storytelling styles

Narrative developmental research on mother-child storytelling has focused on the multiple ways that mothers talked with their children. These studies have identified distinct discourse styles based on individual variability in mothers' array of discourse features when they narrate a storybook, usually a wordless picture book, to their preschool-aged children. As a leading name, Melzi and colleagues (2005; 2011) have investigated storytelling styles with culturally diverse mother-child dyads (English-speaking European Americans, Spanish-speaking Peruvians). According to their results, there were two distinct storytelling styles: *storyteller* and *story builder*. The mothers who adopted the former style had the distinct feature of frequently providing elaboration for their children rather than eliciting from them. Compared to storytellers, story builders adopted the more interactive style by frequently asking for their children's elaborations and frequently using conversational elements (e.g., evaluation of child responses). In both studies, most of the Peruvian mothers were assigned to the storyteller style, whereas most Americans adopted the story builder style.

A recent study with Spanish-speaking Costa Rican mother-child dyads (Carmioli et al., 2022) has also found two storytelling styles (*storyteller*, and *story builder*) that follow an identical pattern of talk with those found in Melzi's studies. Similar to Peruvian mothers, most Costa Rican mothers were found to adopt the storyteller style which they acted as the main narrator of mother-child storytelling narratives. Another study conducted with Spanish-speaking (from diverse Latino nationalities) and low-income mother-child dyads (Casper, 2009) has identified three groups of mothers whose discourse varied in forms of elaboration and conversational elements. In addition to *storyteller* and *story builder* styles, some mothers adopted the *abridged-storyteller* style which was conceptualized as a form of storyteller style with frequent use of both narrative and nonnarrative elaboration provisions. Mothers in this study were almost equally assigned to these three storytelling styles.

Furthermore, a study conducted with high-educated and Spanish-speaking Guatemalan-Mayan mothers has identified five distinct storytelling styles which mostly vary in the degree to which they used elaboration provisions and requests, as well as their conversational talk (Nieto et al., 2019). Although their labels (*readers, information providers, interactive, information requesters, literacy-focused*) were slightly different from the previous findings, based on similarities in their features these styles were combined into the two broad storytelling styles of *storyteller* and *story builder*. Accordingly, Guatemalan-Mayan mothers were almost equally distributed to the two styles.

Taken together, these studies have revealed that half or more than half of Spanish-speaking mothers adopted the main narrator role by providing elaborations for their children without asking for or evaluating their contributions when they narrate a storybook. Although evidence for Turkish mother-child dyads is limited, one study has found the same two patterns of storytelling styles (i.e., *storyteller*, *story builder*) and indicated that most Turkish-speaking mothers adopted the narrator style in line with Spanish-speaking mothers (Mutlu, 2018).

Besides research with Spanish-speaking samples, a recent study (Leyva et al., 2021) with Indian, German, and American mother-child dyads has identified two maternal

storytelling styles (i.e., *followers*, *storyteller-followers*). Each style of mothers similarly used higher rates of conversational talk respectively than elaboration provisions and requests. However, compared to followers, storyteller-followers used more elaboration provisions, and German and Indian mothers were more likely to adopt this style than American mothers. In contrast, American mothers were more likely to be followers who used conversational elements more frequently than storyteller-followers.

These findings suggest that mothers vary in their patterns of talk during storytelling, in the manner in which they elaborated and reciprocated their children's contributions. These features reflect mothers' level of interactivity that assigns participation roles for both mothers and children in these narrative interactions. Accordingly, while the labels vary slightly, two main storytelling styles assigned specific roles to mothers and children (narrator and listener). However, with some cultures, additional styles might fall somewhere between the two ends of this continuum.

1.3.2 Maternal reminiscing styles

Mothers' discourse patterns have been investigated in the other daily context of mother-child conversations about past experiences, or reminiscing conversations. Compared to storytelling, reminiscing context covers less structured conversations since the personal narratives are unlikely to follow a strict plot framed by text or pictures. In that spirit, reminiscing research has mostly studied mother-child conversations about their personal and shared memories that they were asked to decide themselves.

Earlier work on mother-child talk about their unique past experiences has identified mothers' reminiscing styles featured by their use of elaborations and repetitions. For instance, Reese and Fivush (1993) have found that English-speaking European-American mothers showed two reminiscing styles: *elaborative*, and *repetitive*. Elaborative mothers had distinctly more frequent use of elaboration provisions and requests, while they were less likely to repeat their previous utterances compared to the repetitive mothers. With a culturally identical sample, Haden and Fivush (1996) have identified two reminiscing styles (*high-elaborative*, and *low-elaborative*) which correspond to the features of the elaborative and repetitive styles.

Individual differences in mothers' use elaboration and repetition have been cross-culturally supported. As one of the representatives, Wang and colleagues conducted a series of studies that investigated maternal reminiscing styles across Chinese- and English-speaking mother-child dyads (Chinese, Chinese immigrant, and European-American). These studies have indicated consistent results that European-Americans used more elaborations (both provision and request), but fewer repetitions than Chinese-speaking mothers (e.g., Wang, 2007; Wang et al., 2000). Sahin-Acar and Leichtman (2015) have also identified Turkish mothers' reminiscing styles concerning their use of elaborations and repetitions. In this study, Turkish mother-child dyads from two different cities in Turkey (a landlocked Eastern city and a Western port city) have been compared with American dyads. The results showed that American mothers used more elaborations (both provision and requests) than Turkish mothers from either city, while Turkish mothers' styles did not differ between Western and Eastern cities of Turkey. However, both Western Turkish and American mothers used repetitions similarly and less frequently than Eastern Turkish mothers. These findings suggest both within- and across-culture differences in mothers' reminiscing styles and shed light on Turkish mothers' use of elaboration and repetition during mother-child past event conversations.

Another line of research has revealed the interactivity in mothers' discourse as a distinctive feature of their reminiscing styles in addition to the elaboration and repetition dimensions. To illustrate, Melzi and colleagues (2011) have clustered and compared the reminiscing styles of Spanish- and English-speaking mothers (Peruvian- and European-American). There were two reminiscing styles that mothers from each culture fit.

Elicitor mothers supported their children to be the main narrator of the memory conversation by using frequent elaboration requests and conversational talk. However, *constructor* mothers were equal partners in these conversations since they kept a balance between their use of elaboration requests and statements (i.e., provisions). In this study, most European-American mothers adopted the constructor style, while Peruvian mothers were more likely to adopt the elicitor style that placed children in the center of reminiscing conversations. Carmiol and colleagues (2020) have also found the same reminiscing styles in another Spanish-speaking sample. Similar to Melzi's findings, most European-American mothers adopted the constructor style, whereas Spanish-

speaking Costa Rican mothers were equally assigned to the constructor and elicitor styles.

In addition to the elicitor and constructor styles indicating mothers' tendency to assume either the role of the active listener or equal conversational partner, some studies have evidenced mothers who take dominant narrator roles during mother-child memory conversations. For example, Haden (1998)'s study conducted with European-American dyads investigated maternal reminiscing styles in the degree and forms to which mothers use elaborations and found three groups of mothers: *high elaborative*, *low elaborative*, and *declarative*. While the first two groups distinguished in how much they elaborated regardless of the form of their elaboration, *declarative* mothers with frequent use of elaboration statements provided most of the memory details without asking about their children's recall.

In another study with Chilean mother-child dyads, Leyva and Nolivós (2015) have also shown a similar pattern of maternal reminiscing in addition to the elicitor and constructor styles when the dyads conversed about their emotionally negative past experiences. This *didactic* style of mothers mostly provided their children with elaborations. However, in contrast to the declarative mothers in Haden's study, the didactic mothers had frequent use of nonnarrative elaborations which were not directly related to the memory content. This in turn implies their directive purposes in past event conversations such as providing children with general world knowledge, problem-solving, or planning future behaviors based on the contents of the memory.

Taken together, these studies suggest several compelling ideas in mothers' reminiscing styles. First, there are two lines of research. One of them revealed distinct reminiscing styles in the degree to which mothers use elaborations and repetitions. The other line also showed that the manner in which mothers use elaborations (provision or request) and conversational features play a role in determining their roles in reminiscing conversations. Research with culturally diverse dyads showed that mothers are likely to assume reminiscing styles that promoted children's active contributions in memory reconstruction. In this regard, it is essential to consider both elaborative and interactive features in mothers' discourse when examining their discourse styles in each context.

With these discourse features, mothers assign participation roles for themselves and their children; that is depict how to verbally scaffold their children's engagement in narratives. In line with the literature, the current study hypothesized that, in each narrative context, there would be at least two distinct styles of mothers whose discourse patterns vary by their level of interactivity.

1.4 Maternal discourse in relation to children's perspective-taking (PT)

One of the central blocks of early socio-cognitive competence is children's perspective-taking (PT) abilities. This ability broadly refers to children's conceptual appreciation of how people see and interpret the world depending on their own perspective (Perner, 2000). From a sociocultural perspective, the acquisition and development of such social understanding essentially rely on the existence and interpretation of multiple perspectives. Parent-child interactions serve as collaborative contexts for this socially-constructed ability (Bruner, 1990; Nelson, 1996; 2007). Language in these exchanges allows for making meaning through of the perspectives embedded in social situations. Through these linguistic tools, children acquire the ability to comprehend and infer self and other perspectives.

Developmental research brings maternal discourse in mother-child narrative interactions to the forefront, regarding the ways in which mothers verbally support their children's experiences with different perspectives (de Rosnay & Hughes, 2006; Fivush & Nelson, 2006; Nelson, 1996; 2007; Harris, 2005). Mothers as more skilled and experienced conversation partners use verbal strategies to promote their young and inexperienced partners' engagement in shared discourse. As a major contribution to preschoolers' perspective-taking abilities, mother-child storytelling and reminiscing contexts elicit children's thinking and talking about multiple perspectives (e.g., self, and others). In both contexts, one's personal view is embedded in fictional or personal event scripts, and offered in a temporally and causally structured chain.

Conversations about these narratives could be especially important and meaningful for children's perception of the self (or the characters) that continues across time and that is distinct from others (Fivush et al., 2006; Fivush & Nelson, 2006; Nelson, 2007). Within

shared narratives, mothers promote their children to develop this perception through detailed descriptions of event specifics and personal evaluations. In other words, mothers' elaborations may help children to relate one's previous view continuously to the present and into the future, as well as to relate one's view to consistent internal or behavioral outcomes. Indeed, some studies have suggested that maternal discourse during narrative exchanges, specifically the manner and the degree to which they elaborate significantly contributed to children's understanding and discussion of perspectival discrepancies. The following sections discuss relevant findings on children's visual, socio-cognitive, and syntactic perspective-taking (PT) abilities. In the current study, mothers' patterns of discourse were investigated in terms of their interactive features to encourage children's contributions, in relation to children's PT.

1.4.1 Maternal discourse styles and children's visual PT

Visual PT refers to children's understanding that depending on the visual vantage point one might see different things simultaneously, or the same thing differently (Flavell et al., 1981; 1983). This ability constitutes a prior step in children's developing social understanding beginning from their appreciation of multiple perspectives with visual evidence and continuing with their simulation between higher-order cognitive conflicts (Müller et al., 2012). In this respect, as a primitive form of such ability, children's visual PT could be promoted by maternal discourse that provides children with a rich source of perspectival thinking and simulation through narrative interactions. A limited number of studies have investigated mothers' verbal contributions to children's visual PT, especially within the context of reminiscing. For instance, Reese and Cleveland (2006) have found that mothers' elaborative style of reminiscing concurrently predicted children's visual PT abilities. Regardless of the form (request or provision) how frequently mothers used elaborations was positively related to their children's understanding of how visual clues (seeing or not seeing) relate to knowledge.

To the best of our knowledge, there is no research investigating how maternal storytelling styles would be associated with children's visual PT abilities. Based on findings in the reminiscing context, however, one might expect similar contributions from mothers' storytelling styles. Mothers' narrative scaffolding may provide children

with rich input of information and perspective about the narrative event to discuss and exchange within a conversational context. Specifically, how mothers are detailed (i.e., elaboration) and how they encourage their children's participation (i.e., interactivity) might contribute to their children's understanding of the differences in visual perspectives. In partial evidence for this argument, a reminiscing intervention trained mothers to frequently talk about memories with their children and to use more elaboration, especially for encouraging their children's participation in these conversations (Taumoepeau & Reese, 2013). The training was found to be effective in children's increased perspectival understanding including their visual PT.

Given that narrative conversations offer multiple perspectives to comprehend and share with others, both storytelling and reminiscing interactions aid children's social understanding via conversational back-and-forth (e.g., de Rosnay & Hughes, 2006; Harris, 2005; Nelson, 2007). As a primary form of their social understanding, children's representation of different visual perspectives might be specifically promoted by mothers' interactive discourse styles since the shared conversational roles would provide children with a high opportunity to think and practice simultaneously with self and other perspectives. Thus, the current study hypothesized that mothers' discourse styles would similarly contribute to children's visual PT abilities in each narrative context, and children whose mothers adopted more interactive discourse styles would show better visual PT performances than the children of the less interactive mothers.

1.4.2 Maternal discourse styles and children's socio-cognitive/epistemic PT

False belief (FB) understanding refers to children's ability to simultaneously hold multiple psychological perspectives (e.g., beliefs), some of which may contrast with reality (Miller, 2012). This ability can be conceptualized as one of sophisticated socio-cognitive or epistemic PT as requiring children to differentiate between their own and others' knowledge about the world.

In the literature, the links between children's FB understanding and their experience with maternal discourse have been demonstrated within reminiscing and storytelling contexts. It is important to note that these two lines of research vary in terms of the

aspects in which they investigated mothers' ways of verbal scaffolding. On the one hand, research in the mother-child storytelling context has focused on the frequency of mothers' mental state references and supported its concurrent and longitudinal contributions to children's FB skills (see Devine & Hughes, 2018; Tompkins et al., 2018 for meta-analyses). On the other hand, studies on reminiscing conversations have examined mothers' discourse patterns with various features in relation to children's FB understanding.

Ontai and Thompson (2008) have shown that children's performances on FB tasks were not associated with their mothers' references to mental states, but positively related to how frequently their mothers used elaborations (either the form of request or provision) when talking about shared past events. Similarly, Welch-Ross (1997) has found that children whose mothers used more elaboration in reminiscing had better FB understanding than children of less elaborative mothers. However, mothers' repetitions of their previous utterances were not related to children's performances on FB tasks. In addition, Taumoepeau and Reese (2013) have shown the positive effects of mothers' use of elaborations and utterances that encourage their children's participation in memory conversations on both children's visual and socio-cognitive PT abilities.

These studies underline the role of maternal reminiscing styles, specifically how frequently they introduced event details and personal interpretations (i.e., *elaboration*) into the conversation, on children's understanding of conflicting beliefs (Fivush & Nelson, 2006). However, there is a lack of research that examined the relations between mothers' storytelling styles and children's FB understanding. This might be due to less frequent engagement in self-versus-other perspectives placed on storytelling conversations compared to other discourse contexts (see Ilgaz & Allen, 2021 for a discussion). Nevertheless, it is arguable that each narrative conversation in which mothers elaborate, encourage their children's participation, and talk about their personal evaluation of self and other perspectives may support children's FB understanding. In this sense, the current study expected that mothers' interactive discourse styles in each narrative context (storytelling, reminiscing) would positively contribute to children's understanding of conflicting beliefs.

1.4.3 Maternal discourse styles and children's syntactic PT

One of the significant achievements in children's language development is their ability to comprehend and produce complement clauses. These complex structures allow for embedding the expression of perspectives on reality within a single sentential proposition (e.g., "I know that [proposition]"). In this sense, one might consider such linguistic ability as an important predictor of children's FB understanding, (de Villiers & de Villiers, 2014; Hale & Tager-Flusberg, 2003). In tandem with our focus on children's perspective-taking abilities, the current study has considered this ability as "syntactic perspective-taking" based on the perspectival input embedded in sentential features. Studies on children's syntactic abilities have shown important contributions of parent-child narrative interactions in the emergence and development of this ability during the preschool years (e.g., Aksu-Koç & Aktan-Erciyes, 2018; Hoff-Ginsberg, 1990). However, to the best of our knowledge, this study constitutes a first in examining this relation with mothers' discourse styles.

Our argument on mothers' discourse styles as scaffolds for children's syntactic PT is based on two main claims. First, mothers may contribute to their children's experiences with different perspectives through elaborations during both storytelling and reminiscing conversations. Specifically, their use of elaboration requests asking for children's evaluation of their own epistemic stance or attitude (e.g., "Did you know that the child had fallen off the cliff?" [storytelling]; "Do you think that we had fun there?" [reminiscing]), or elaboration provisions presenting mothers' evaluations of their own epistemic stance or attitude (e.g., "I didn't think that the frog would come back to the home." [storytelling]; "I already guessed that the last piece might be in the toy box." [reminiscing]) may support children's syntactic PT abilities.

Secondly, mothers may support their children's syntactic PT by providing them with grammatically sophisticated language during both storytelling and reminiscing conversations. For instance, previous work with Turkish-speaking mothers has shown their inclination to use complement clauses frequently in mother-child story narrations (Ilgaz et al., 2021). Similarly, another study conducted with English-speaking mothers has evidenced that mothers used more complex and diverse language in terms of

vocabulary and syntax during storytelling discourse compared to other nonnarrative conversations (Demir-Lira et al., 2019). Despite the lack of evidence, reminiscing as another form of narrative discourse may also provide children with complex grammatical structures, since it naturally reflects on experiences with another. Through mothers' sophisticated and interactive input (e.g., "I don't remember that we met a fish there, do you?"), children might take an opportunity to practice and develop their syntactic language skills. Thus, the current study expected that mothers' interactive discourse in each narrative context would be positively related to children's syntactic PT.

1.5 The current study

In the light of the literature, this study addressed two main questions. The first was whether Turkish-speaking mothers showed distinct discourse styles in mother-child storytelling and reminiscing conversations. In each narrative context, we examined how mothers' individual patterns of talk differ from each other in terms of the interactive features of the discourse (i.e., forms of elaboration and conversational elements). The lack of research on Turkish-speaking mother-child dyads hindered our definite hypotheses and made maternal discourse styles in storytelling and reminiscing exploratory. However, we still expected that mothers would show at least two distinct discourse styles in each context. In line with research conducted with both Turkish-speaking and culturally diverse samples (Leyva et al., 2021; Melzi et al., 2011; Mutlu, 2018; Sahin-Acar & Leichtman, 2015), we expected that mothers would show individual variability in their use of elaboration forms (provision, request) and conversational features through which they determine the shared narrative roles and contribute to the interactivity (i.e., back-and-forth) of the conversation.

The second research question addressed whether and how mothers' storytelling and reminiscing styles relate to children's PT abilities. Previous findings on the link between maternal discourse styles and children's understanding of perspectival differences, such as visual PT or FB understanding have suggested positive contributions of maternal elaborations in reminiscing context (e.g., Reese & Cleveland, 2006; Ontai & Thompson, 2008) and of maternal mental state talk in storytelling context (e.g., Ruffman et al.,

2002). It remains unknown how mothers' discourse styles, which differ in their level of interactivity contribute to their children's PT.

Based on the rich perspectival input that storytelling and reminiscing conversations provided for mothers and children to express and discuss, both contexts may contribute to children's comprehension of different perspectives. We expected that maternal storytelling and reminiscing styles would contribute to children's PT abilities in terms of scaffolding their participation in these dyadic conversations. More specifically, mothers' interactive discourse styles in each context that promote children's linguistic and cognitive engagement in the narrative conversation would be positively related to children's abilities of visual PT, FB understanding, and syntactic PT. Given the lack of evidence, however, it should be noted that mothers' storytelling and reminiscing styles may not mirror in predicting children's PT abilities based on contextual nuances in content and function. Thus, the current study contributed to the limited literature on the relation between children's PT abilities and maternal discourse styles across various narrative contexts.

Furthermore, this study contributed to the extant literature in multiple ways. We introduced several methodological novelties that increase both within- and between-context comparability of mother-child narrative conversations. First, we used a structured memory for each mother-child dyad to reminisce, which controls for the individual variance across the dyads in the familiarity, memorability, and personal value of the past event being discussed. Second, mothers' retellings of the same storybook were used to assess their storytelling style as being comparable with their reminiscing conversations in which the mother and the child were equally familiar with the narrative content. To increase comparability, we also used visual prompts to elicit mother-child conversations in each context of storytelling (i.e., storybook depictions) and reminiscing (i.e., the photo of lab memory).

To strengthen statistical power in hypothesis testing, the current study included potential child, mother, and experiential variables in the analyses. Having significant relations not only with mothers' discourse styles (e.g., Haden et al., 1996) but also with children's abilities of PT (e.g., Moll et al., 2013), the current study included children's age in each

step of analyses. Child vocabulary skills were included as another child variable to control for the potential shared variance between children's linguistic competence and their perspectival understanding (e.g., Slade & Ruffman, 2005). Given mixed findings in the literature (see Waters et al., 2019 for meta-analysis), child gender was also included to check if maternal styles would differ across boys and girls. Based on previous findings that evidenced a variance in mothers' quality of storytelling and reminiscing discourse by their education level (e.g., Hoff-Ginsberg, 1991 with English-speaking dyads; Cengiz, 2013; Küntay & Ahtam, 2004 with Turkish-speaking dyads), maternal education was included as another control variable. Lastly, how frequently mother-child dyads engage in storytelling in their daily lives, and the number of times that they talked about the structured lab memory before the study reminiscing were included as potential experiential variables that might be related to maternal discourse in either narrative context.

CHAPTER 2

METHOD

2.1 Participants

The current study recruited native Turkish-speaking mothers and their 3- to 5-year-old children. One hundred twenty of 126 mother-child dyads completed each study session and were included in the final sample. Six of them were excluded since they only attended the first session. Of 120 children, 45 were 3-year-olds ($M_{\text{age-in-months}} = 40.29$, $SD = 11.12$), 38 were 4-year-olds ($M_{\text{age-in-months}} = 52.11$, $SD = 3.5$), and 37 were 5-year-olds ($M_{\text{age-in-months}} = 65.78$, $SD = 3.51$). Children's gender was approximately equally distributed to each age group (24 3-year-old girls, 21 4-year-old girls, and 21 5-year-old girls).

Study announcements were made through social media platforms and internal listservs of Bilkent University following ethical approvals. The data was collected in Ankara, Turkey. The mother-child dyads were from “middle” or “upper-middle” families according to mother-reported socioeconomic variables. Descriptive statistics of family demographics were presented in Table 1.

2.2 Procedure

The current study consisted of two sessions. For the first session, each mother-child dyad was individually invited to the developmental psychology laboratory at Bilkent University. Mothers were first asked to fill out demographic and literacy information forms and to review a wordless storybook they would narrate at the end of the session while sitting in the waiting room of our lab. Meanwhile, children engaged in a 10-min warm-up play in the testing room with the researcher. Following the warm-up play, children completed a set of tasks in a fixed order of increasing verbal demands (visual perspective-taking (PT), false belief, and syntactic PT tasks). After child assessments, mothers and children engaged in a 10-min free play activity to have a fun break before the narrative activities. Mothers were then asked to narrate the storybook as naturally as they do at home. Upon their completion of storytelling, the ‘treasure hunt’ game was introduced to mothers and children to complete as a final task of the lab visit. Children were rewarded with a ‘treasure’ box including gifts such as crayons and sea-themed books.

Table 1. *Descriptive statistics of family demographics.*

	Mother	Father
Mean of age (SD)	35.33 (4.61)	38.87 (5.17)
Age Range	24-48	29-55
Education status %		
Secondary school and below	3.3	2.5
High school	12.5	12.5
Undergraduate	49.2	50.8
Graduate	35	33.4
Mothers’ evaluation of family income		
Low	1.7	
Middle	44.5	
Upper-middle	47.1	
Upper	6.7	
Number of children %		
Single child	57.1	
Two children	36.1	
Three children	5.9	
Four children	.8	

Mother-child dyads were visited in their homes approximately one week after their lab visit ($M_{\text{day}} = 8.47$, $SD = 2.11$, ranging from 5 to 18 days). In this session, children first completed vocabulary tasks. Next, mothers were asked to narrate the same storybook for a second time. Mothers and children were then presented with their printed photo from the ‘treasure hunt’ game in the first session and asked to talk about their ‘treasure hunt’ experiences as naturally as they would reminisce in daily life. At the end, mothers were asked about the frequency of reminiscing about this game with their children after the first session. Each session was video-recorded and took approximately two hours. Mother-child storytelling and reminiscing conversations during the home-visit session were used as the target narratives for further coding and analyses of maternal talk.

2.3 Measurements

2.3.1 Child measurements

2.3.1.1 Visual perspective-taking tasks

Two tasks were used to measure children’s ability to take one’s visual perspective. *The First- and Second-Level Visual Perspective-Taking task* (Flavell et al., 1981) measured understanding that two people might see different things simultaneously (i.e., first-level), and the same thing differently (i.e., second-level) based on their visual point of view. For the first level, children were presented with a card illustrating different animal pictures on the front and back (e.g., cat vs. dog). Upon the demonstration of both sides, the card was randomly turned several times, and shown to children in a way that they are able to see only one side. Next, children were asked about what the researcher saw. This procedure was administrated four times for each card, and there were two different cards. Children received one point for each correct response. For the second level, a card with an animal illustration was placed on the table in a way that the same picture looks different depending on one’s point of view. Children were asked about how the researcher perceived the picture (e.g., right-side-up turtle or upside-down turtle). The researcher randomly turned the card several times and repeated the same procedure for each trial. There were two different cards and six trials on each card. Children received

one point for each correct answer. The maximum total score for the first- and second-level visual PT task was 18.

The second task was the *Color Mix* task (Moll & Meltzoff, 2011). This task measured children's ability to manipulate a picture stimulus appropriate to one's visual perspective. Children were first introduced to a yellow screen that changes the color of the object (blue to green) when placed behind it. Children sat directly across from the screen and were shown blue cardboard cutouts. Children were then asked to place the cutout at a location that would allow the researcher to see it either as green or blue. There were two animal-shaped cutouts (i.e., horse, dog), and two trials for each cutout. Children received one point if they placed the cutout appropriate to the color that the researcher asked for. The maximum score was four.

2.3.1.2 False Belief tasks

Three tasks were used to assess children's understanding of false beliefs (FB). First, *the Appearance-Reality task* measured the ability to distinguish between the representative and real identities of one deceptive object (Flavell et al., 1983). If children correctly answered the questions about the conflicting identities of the object, they passed the task and received one point. Two objects were used in the current study (a box that looks like a book; a pencil case that looks like a banana).

The second FB task was *Unexpected Location* (Wimmer & Perner, 1983). This task assessed children's ability to make inferences about one's behavior emerging out of a false belief (i.e., a belief conflicting with reality). Children were presented with six picture cards depicting a story. Accordingly, a child character puts a chocolate bar in the drawer. When the child leaves the kitchen, the mother changes the location and puts the chocolate bar in the fridge. Children who remembered the true location of the chocolate and correctly predicted the child's mistaken action passed the task and received one point.

Lastly, *the Second-order FB task* was used to measure children's understanding that one may have a false belief about another's belief (Astington et al., 2002). Children were

presented with a story with five picture cards. According to the story, a child character (target) hides an object under the blanket in the presence of another child character. When the target child leaves the room, the other child moves the object to the drawer. The target child returns to the room and unexpectedly witnesses the object's change of location from the doorway. The other character does not notice the target's presence and witness. If children correctly answer all control questions to test their comprehension of the story, they were asked first-order and second-order test questions. The first-order question is about whether the other character knows that the target witnessed the relocation of the object. The second-order question is where the other character would think the target would look for the object. Children who correctly responded to all the questions passed the task and received one point.

In all FB tasks, the forced choices were presented to children in a counterbalanced order (correct answer before foil, foil answer before correct). The counterbalanced versions were equally distributed to children's age and gender groups.

2.3.1.3 Syntactic perspective-taking task

Children's ability to understand and produce single- and double-embedded syntactic structures, i.e., complement clauses, were assessed via the task of *comprehension of complement clauses* (Altan, 2008). Children were first introduced to a puppet who was described as talking to only children. Then, children were told to ask the puppet what the researcher wanted to ask. Out of 12 questions, six were for single-level complementation (e.g., "Ask him what he will *draw*."), while six were for double-level complementation (e.g., "Ask him to *tell* you what he *played* with his friends yesterday."). Children received one point for each correct production of single-level questions and two points for each correct double-level question. The maximum total score was 18.

2.3.1.4 Vocabulary tasks

To measure children's vocabulary skills, the Turkish Expressive and Receptive Language Test (TIFALDI) was used. This test included two subtests: one for the expressive, and one for the receptive vocabulary (Berument & Güven, 2013). The

expressive vocabulary test consisted of 80 pages of which a target picture was depicted. If children correctly named the target picture, they received one point. The receptive vocabulary test consisted of 104 pages with four pictures on each page. If children correctly pointed to the target word on the page, they received one point. Children's composite scores on each subtest yielded their expressive and receptive vocabulary scores.

2.3.2 Parent report

2.3.2.1 Demographic form

Mothers filled out a questionnaire that asks parents' age and education level, as well as children's birth date, number of siblings, and family income.

2.3.2.2 Literacy check

Mothers were asked to report how frequently they narrate a storybook with their children. This question was included to check their daily literacy habits as possibly interfering with their storytelling styles (see Appendix A for mother-reported demographic form and literacy check).

2.3.2.3 Reminiscing check

Mothers were asked to report if they had reminisced about the "treasure hunt" experience with their children after the first session. If they had, they were then asked how frequently they talked about this memory within the past week. These questions were included to check the possible practice effect on maternal reminiscing styles (see Appendix B for mother-reported reminiscing check).

2.4 Mother-child narrative conversations

2.4.1 Storytelling

A wordless storybook, '*Frog, where are you?*' (Mayer, 1969), was used to elicit mother-child storytelling conversations. The dyads narrated the book twice (once per session).

The book was selected as unfamiliar to Turkish mother-child and commonly used in narrative research with diverse cultures including Turkish (Berman & Slobin, 2013). It consists of 24 pages with black-and-white pictures depicting a story of a little boy who searches for his pet frog.

2.4.2 Reminiscing

A semi-structured game, '*Treasure hunt*', was scripted by the research team to be the subject of mother-child reminiscing conversations. Mothers and children played the game as a final task of the first session. The game was sea-themed and required mother-child dyads to complete a fish-shaped puzzle by looking for the hidden pieces around the lab room. Six puzzle pieces were hidden in predetermined spots in the lab, of which two were difficult places to find in order to increase the memorability of the game event. Following the completion of the puzzle, children were first presented with a treasure box with crayons and several books as a gift for their participation, then introduced to a living goldfish named 'Kraker'. At the end of the game, the researcher took a photo of the dyad with game materials (e.g., puzzle, goldfish, gift box). In the second session, the dyads were presented with their printed photo of 'Treasure Hunt' as a memory cue and to talk about their experiences in this game as naturally as they would reminisce in daily life (see Appendix C for the script of Treasure Hunt game).

2.5 Coding

Mother-child narrative conversations during the second session (i.e., their second narration of the storybook, and their reminiscing conversations about the treasure hunt game) were transcribed verbatim from the video records and examined further in the current study. We specified the starting and ending points of mother-child talk by their verbal (e.g., "Shall we start?", "That's all we talked about.") or nonverbal cues (e.g., leaving the place, nonstop silence). Their talk in storytelling and reminiscing contexts was initially examined in terms of length. Next, maternal talk in each context was further coded and analyzed for discourse styles.

Four coders took part in the data coding process: the researcher and three psychology undergraduate students who were blind to the hypotheses of the current study. For training purposes, five storytelling and five reminiscing transcripts were coded by the four coders as a whole group. The four coders were then divided into two coding dyads. The remaining transcripts (115 storytelling, 115 reminiscing) were equally distributed to the coding dyads. Each coder first coded the data individually and then compared it with the other coder in her dyad.

Based on 25% of the transcripts, we examined inter-rater reliability between the two coders of each coding dyad and calculated each dyad's Cohen's kappa values separately for each narrative context and for each coding category. Accordingly, the dyads achieved 'almost perfect' agreement across the contexts and coding categories (Cohen, 1960). The coders in one dyad agreed with each other between 92% and 99% while coding storytelling, and between 87% and 98% while coding reminiscing conversations. The coders in the other dyad agreed with each other between 90% and 99% for storytelling, and between 92% and 98% for the reminiscing context. In addition to the within-dyad agreement, to increase coding reliability and maintain high fidelity and consistency across the coding dyads, the four coders met on a weekly basis to discuss each dyad's disagreements as a whole group. The whole-group consensus on the initial disagreements were entered into the final dataset.

2.5.1 Mother-child narrative length

Mother-child discourse on storytelling and reminiscing was first divided into utterances. Each utterance (i.e., communication unit or C-Unit) is composed of a main clause with its dependent subordinate clauses (MacWhinney, 2000). Mothers' and children's total number of C-units were individually calculated to indicate their individual amount of talk, i.e., narrative length. We examined mothers' and children's narrative length separately for each narrative context.

2.5.2 Maternal discourse style

Each maternal C-Unit was further coded for their discourse styles. The coding was mutually exclusive with several main and sub-coding categories. The current study adapted a coding scheme from Melzi et al. (2011) and Reese and Fivush (1993). In line with the study hypotheses, a comprehensive scheme was created to capture mothers' discourse styles depending on their use of elaborations, interactive discourse features, and repetitions. Accordingly, the main coding categories were elaboration provisions, elaboration requests, conversational talk, repetitions, nonnarrative related talk, unrelated talk, and other talk (see Appendix D for the detailed coding scheme).

2.5.2.1 Narrative elaboration provisions

This category coded for maternal utterances that provided new information or personal evaluation pertaining to the narrative. The coding included mothers' elaboration provisions in the form of statements or tag questions (e.g., "The boy was searching for his frog in the forest."; "We were so happy to find the last piece, weren't we?").

2.5.2.2 Narrative elaboration requests

This category coded maternal utterances that asked for new information or personal evaluation of the child relevant to the narrative content. The coding included mothers' elaboration requests in various forms: open-ended questions (e.g., "What did we play in this room?"), closed-ended question (e.g., "Will they find their frog?"), fill-in-the-blank questions ("And they gave us in a box...?"), and memory prompts (e.g., "Anything else you want to tell?"; "What happened then?").

2.5.2.3 Conversational talk

This category coded maternal utterances that do not provide or elicit new information or aspect to the narrative discussion, but indicate mothers' attempts to contribute to the flow of the conversation. This coding included several subcategories: evaluations to the child's response (e.g., "You're right.", "No, it's not."), conversational repetitions of the child's previous response (e.g., Child: "One piece was under the green pillow." Mother:

“One was under the pillow.”), clarifications (e.g., “Who then came to the room did you say?”; “Repeat loudly.”), backchanneling (e.g., “Uh-huh”), and attention moderators/story fillers (e.g., “Look what happened here!”; “Have you seen our picture?”).

2.5.2.4 Repetitions

This category coded maternal utterances that repeat mothers’ previous elaborations. The repetitions were either in question or statement forms and included not only structurally identical but conceptual repetitions that repeat the gist of the previous utterance (e.g., Is it nighttime in this picture? *Is it nighttime here?*”; “We met a fish named Kraker. *Right, his name was Kraker.*”)

2.5.2.5 Nonnarrative related talk

This category coded maternal utterances that were not directly but tangentially related to the narrative event. This coding included several subcategories as follows: future inferences (e.g., “Next time we look all over the room.”), fantasy talk (e.g., What would you do if your frog run away?), general knowledge (e.g., “You know, wooden puzzles are much healthier.”), personal experience (e.g., “We saw such a frog once, didn’t we?”), meta-literacy (e.g., “This is a wordless book.”), meta-narrative (e.g., “Let’s tell the story together.”), and meta-memory comments (e.g., “Oh, you must have forgotten about that.”).

2.5.2.6 Unrelated talk

This category coded maternal utterances that were totally irrelevant to the content of the narrative (e.g., “God bless you honey!”, “Hang in there, we’re almost done.”).

2.5.2.7 Other talk

Maternal utterances that were unclassifiable, incomplete, or consisted of paralinguistic or nonverbal expressions were coded for this category.

CHAPTER 3

RESULTS

3.1 Descriptive analyses

The current study addressed two research questions: a) whether Turkish mothers showed distinct discourse styles in storytelling and reminiscing conversations with their preschool-aged children? b) whether and how mothers' styles in each narrative context would contribute to children's perspective-taking (PT) abilities? Prior to the main analyses, we ran preliminary analyses for descriptive statistics and correlations of children's task performances and mothers' discourse features. All statistical analyses were performed with IBM Statistical Package for the Social Sciences (SPSS) version 25. We should note that six of 126 mother-child dyads were excluded as they failed to complete the second study session (target narrative session). Our preliminary and main analyses were consequently conducted with the final sample of 120 dyads.

In the following two sections, first, children's performances on the target (PT tasks) and control assessments (vocabulary tasks) are presented. The correlations between their task performances are discussed along with their age. Next, mothers' discourse features are described by the narrative context (i.e., storytelling and reminiscing) and family demographics (e.g., child gender, mother education).

3.1.1 Descriptive analyses of child variables

Children's performances on each visual PT, false belief (FB) understanding, and syntactic PT task were examined by their age to ensure that our assessments reflected on children's age-appropriate developmental profiles. All children completed FB and vocabulary tasks, nine did not complete the syntactic PT task, and one did not complete visual PT tasks. The descriptive analyses showed expected age-related increases in children's performances (see Table 2 and Table 3) The univariate analyses of variance (ANOVA) confirmed children's age-appropriate developmental profile by showing significant main effects of age on children's performance on each task ($ps < .001$). In detail, 5-year-olds scored higher than 3-year-olds ($ps < .001$), and the performances of 4-year-olds fell between 3- and 5-year-olds'. As presented in Table 4, child gender showed no consistent relations with children's assessments. However, children's performances on PT tasks were positively related to each other, and to their age and vocabulary performances. We consequently decided to include children's age and vocabulary skills in the main analyses on predicting children's PT abilities.

Table 2. Means (standard deviations) of children's task performance by age group.

	3-year-olds	4-year-olds	5-year-olds
Receptive vocabulary ($Max_{score} = 104$)	54.36 (17.11)	70.63 (12.23)	80.76 (8.28)
Expressive vocabulary ($Max_{score} = 80$)	42.31 (12.83)	53.63 (9.51)	61.70 (9.44)
Syntactic PT ($Max_{score} = 18$)	7.79 (4.87)	10.75 (4.04)	12.89 (2.22)
1 st and 2 nd Level Visual PT ($Max_{score} = 18$)	11.66 (6.5)	14.16 (4.69)	15.92 (4.3)
Color Mix ($Max_{score} = 4$)	3.07 (1.14)	3.45 (1.08)	3.78 (.75)

PT: perspective-taking.

Table 3. Percentage of children passing false belief tasks by age group.

	3-year-olds	4-year-olds	5-year-olds
Appearance-reality: 1 st object (book/box)	20 %	50 %	81.1 %
Appearance-reality: 2 nd object (banana/pencil case)	37.8 %	52.6 %	83.8 %
Unexpected Location	40 %	42.1 %	83.8 %
Second-order FB	4.4 %	10.5 %	40.5 %

FB: False belief.

Table 4. *Bivariate (on the bottom half of the table) and age-controlled (on the top half of the table) correlations of child variables.*

	1	2	3	4	5	6	7	8	9	10	11
1. Age-in-months	1										
2. Gender	.05	1									
3. Receptive vocabulary	.69***	.07	1								
4. Expressive vocabulary	.61***	.14	.78***	1							
5. Syntactic PT	.50***	-.04	.62***	.58***	1						
6. 1st Level Visual PT	.36***	.00	.40***	.38***	.36***	1					
7. 2nd Level Visual PT	.32***	-.05	.44***	.34***	.39***	.55***	1				
8. Color Mix	.31**	-.08	.47***	.35***	.41***	.33***	.38***	1			
9. Appearance-reality	.55***	-.05	.49***	.48***	.35***	.32***	.37***	.39***	1		
10. Unexpected location	.42***	-.14	.49***	.56***	.46***	.28**	.30**	.25**	.40***	1	
11. Second-order FB	.43***	-.09	.57***	.46***	.40***	.25**	.36***	.33***	.28**	.46***	1

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$; PT: Perspective-taking, FB: False belief.

Based on significant correlations, we opted to use children's composite scores on the tasks referring to their final scores in the relevant PT abilities. Accordingly, children's FB scores in further analyses refer to their composite scores on four FB tasks (i.e., unexpected location task, second-order FB task, and two appearance-reality tasks). In addition, children's visual PT scores were calculated by the composition of their standardized scores on each task since the range of scoring varies between visual PT tasks. Children's syntactic PT scores also refer to their total scores in the syntactic complementation task.

3.1.2 Descriptive analyses of maternal discourse features

Mother-child storytelling and reminiscing conversations were first examined in narrative length by aggregating the number of utterances that mothers produced in each narrative context. There was a significant correlation between the length of mothers' storytelling and reminiscing narratives ($r = .27, p = .003$), which evidenced individual consistency in mothers' amount of talk across the two narrative contexts. However, when we compared mothers' narrative length across the contexts, our results indicated that all mothers produced more talk in storytelling ($M = 139.27, SD = 57.49$) than in reminiscing conversations ($M = 70, SD = 38.26$), $t(119) = 12.69, p < .001$; Cohen's $d = 1.16$ 95% CI [58.46, 80.08]. To control for the length differences, we opted to use mothers' proportion scores for each discourse variable (i.e., elaboration provisions, elaboration requests, conversational talk, repetitions, and nonnarrative related talk). We divided mothers' frequency with which they used each discourse feature by the total number of utterances they produced within the relevant narrative conversation. From here on, all findings on maternal discourse show the results with the mothers' proportion scores; that is regardless of their narrative length.

Bivariate correlations among proportioned discourse features that mothers produced in each narrative context were examined along with their relations to child and mother demographics (see Table 5).

Table 5. *Bivariate correlations between the proportioned features of mothers' talk and family demographics.*

	Ch-age	Ch-sex	Mo-edu	Fam-inco	1	2	3	4	5	6	7	8	9	10
Storytelling														
1. Elaboration provisions	.24**	.04	-.25**	-.19*	1									
2. Elaboration requests	-.06	.00	.29**	.16	-.72***	1								
3. Conversational talk	-.22*	-.02	.14	.09	-.81***	.50**	1							
4. Repetitions	-.04	-.06	.05	-.03	-.44***	.15	.33***	1						
5. Nonnarrative related talk	-.23*	.09	.12	.13	-.33***	.15	.17	.18*	1					
Reminiscing														
6. Elaboration provisions	.09	.11	-.21*	-.08	.16	-.13	-.15	-.16	.04	1				
7. Elaboration requests	-.05	.08	.07	.16	.02	.09	-.04	-.02	-.07	-.34***	1			
8. Conversational talk	.20*	-.08	.01	.14	-.08	.01	.19*	.01	-.02	-.21*	-.07	1		
9. Repetitions	-.15	.06	-.11	-.05	-.01	.05	-.11	.23*	.05	.01	.01	-.20*	1	
10. Nonnarrative related talk	.10	.10	.01	-.12	-.17	.10	.17	.28**	.14	-.31**	-.17	-.08	-.19*	1

* $p < .05$, ** $p < .01$, *** $p < .001$; Ch-age: Child age-in-months; Ch-sex: Child sex; Mo-edu: Mother education level; Fam-inco: Mothers' evaluation of family income.

It is noteworthy to discuss several findings presented in Table 5. First, mothers' talk was unrelated to their child's gender. Second, mothers' use of elaboration provision was negatively related to their use of other features within each context. Third, correlations with mothers' reminiscing talk showed that their use of conversational talk was positively related to children's age. In contrast, in storytelling conversations, mothers of older children were less likely to use conversational talk while more likely to use elaboration provisions. These findings imply maternal use of elaboration provisions' moving in the opposite direction of their use of other discourse features and a potential effect of children's age on mothers' interactivity level in those conversations. Lastly, mothers with a higher education degree were more likely to use elaboration requests in storytelling ($r = .29, p = .001$), while they were less likely to use elaboration provisions in storytelling ($r = -.25, p = .007$) and reminiscing ($r = -.21, p = .03$). Based on these correlational findings, children's age and mothers' education were included as control variables in further analyses examining maternal styles and their relations with children's outcomes.

Additionally, we compared mothers' proportioned scores of discourse features across storytelling and reminiscing contexts by a repeated-subjects ANOVA. The results showed that mothers' use of each discourse feature varied by context, ($F(5, 115) = 146.59, p < .001$, partial $\eta^2 = .86$). Specifically, mothers produced more elaboration provisions during storytelling compared to reminiscing conversations ($p < .001$; partial $\eta^2 = .84$). In contrast, they used other discourse features more frequently in reminiscing than storytelling context ($ps < .001$). These findings provided preliminary evidence for Turkish mothers' inclination to adopt a more interactive discourse style in reminiscing context compared to storytelling by their frequent use of elaboration requests (partial $\eta^2 = .75$) and conversational talk (partial $\eta^2 = .59$).

3.2 Main analyses

The following sections present the findings on two main questions of the current study. To address the first question, mothers' discourse styles were separately explored and discussed for storytelling and reminiscing contexts. Maternal storytelling and

reminiscing styles were described in detail with the proportioned scores of discourse features mothers used in each context. We then discussed maternal discourse styles by demographic variables that our preliminary analyses showed significant relations with (i.e., mother education, child age, and gender). Next, our second question regarding relations between maternal discourse styles and children's perspective-taking (PT) abilities, was addressed by a set of regression analyses separately conducted for each context and for each child outcome (i.e., visual PT, FB understanding, syntactic PT). The results on children's PT abilities were discussed within the contributions of maternal discourse styles and other control variables (e.g., child vocabulary, mother education). In addition to testing our main research questions, the style of each mother was compared across the storytelling and reminiscing contexts for exploratory purposes. Each mother's storytelling style was combined with her reminiscing style, and then their combined discourse styles were examined in relation to children's scores on PT tasks.

3.2.1 First research question of the study: Maternal discourse styles

Our first question was whether mothers assume distinct discourse styles (i.e., individual discourse patterns) that vary in their use of interactive discourse features. This question was addressed by two separate cluster analyses for each context of storytelling and reminiscing. Cluster analysis is an iterative statistical method that allows for the grouping of participants emerging from a set of variables (Everitt et al., 2011). To explore maternal styles in each context, the current study conducted this analysis with five proportioned discourse features mothers produced in the relevant context: *elaboration provisions*, *elaboration requests*, *conversational talk*, *repetitions*, and *nonnarrative related talk*. We ran cluster analyses according to the two-step procedure. First, a hierarchical cluster analysis was performed with Ward's linkage method and squared Euclidean distance, and then conceptually interpreted with the statistical output (e.g., dendrograms, scree plots). As the second step, K-means analysis was conducted to compare possible cluster solutions ranging from 2- to 5-cluster. We chose an optimal number of clusters that create homogenous groups with the largest within-group similarity and the smallest between-group similarity. This statistical procedure was

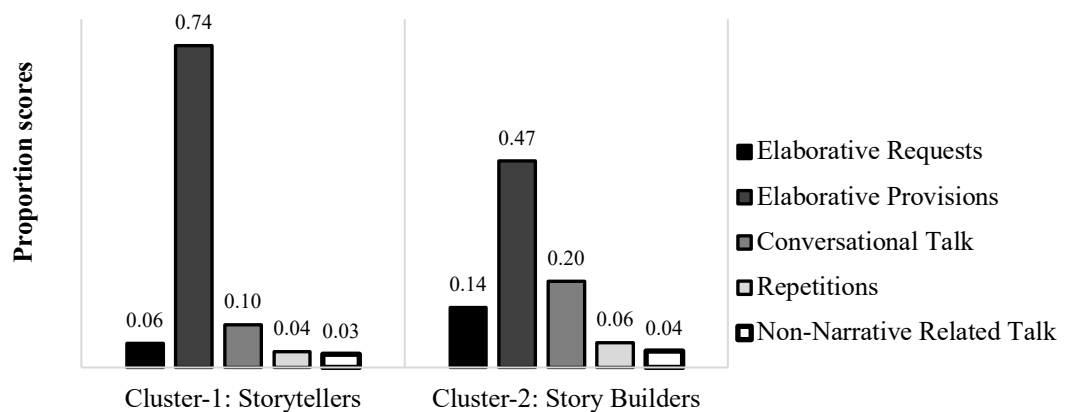
utilized for each context separately (see Appendix E for the clustering procedures and output).

3.2.1.1 Storytelling styles

The clustering procedure showed a two-cluster solution as optimal for clustering mothers into distinct storytelling styles with an acceptable Silhouette index value of 0.49 (Rousseeuw, 1987). All mothers were assigned to one of the two groups of style that significantly differ in their discourse pattern.

As seen in Figure 1, for the mothers in Cluster 1, the majority of their discourse consisted of elaboration provisions (74%), and the rest consisted of 10% conversational talk, 6% elaboration requests, 4% repetitions, and 3% nonnarrative related talk. Of 120 mothers in our sample, most ($n = 77$) appeared in this cluster. Given their discourse pattern providing most of the new information or personal evaluations for their children, these mothers can be conceptualized as adopting the main narrator role in storytelling conversations, while rarely demanding their partner's verbal contributions. Consistent with the previous findings (e.g., Melzi et al., 2011), we named the mothers in Cluster 1 as *storytellers*. (see Table 6 for a script illustrating the storyteller style).

Figure 1. *Clusters of mothers' storytelling styles.*



For the mothers in Cluster 2, 47% of their discourse was elaboration provisions, 20% conversational talk, 14% elaboration requests, 6% repetitions, and 4% nonnarrative related talk. There were 43 mothers in this cluster. Since these mothers used provisions and interactive discourse features (conversational talk, elaboration requests) more balanced, they can be conceptualized as adopting a more interactive storytelling style compared to the storytellers. Via frequent use of elaboration requests and conversational talk, Cluster 2 mothers demanded their children's contributions to the narrative conversations as equally as they provided elaborations for their children. Thus, these mothers were labeled as *story builders* in line with the literature (e.g., Caspe, 2009) (see Table 7 for a script illustrating the story builder style).

Table 6. *A storytelling script illustrating the storyteller style of mothers.*

Speaker: Mother or Child	Utterance (in English)	Utterance (in Turkish)	Coded category
M:	<i>Then, they come to a tree hollow.</i>	<i>Sonra bi ağaç kovuğuna gelirler.</i>	Elaboration provision
M:	<i>They think that would be a squirrel in there.</i>	<i>Orada sincap olduğunu düşündürler.</i>	Elaboration provision
M:	<i>"Hey, have you seen Froggy?" they ask.</i>	<i>"Heey Kurbiş'i gördünüz mü?" diye sorarlar.</i>	Elaboration provision
M:	<i>(He) doesn't know what is inside.</i>	<i>İçinde ne olduğunu bilmiyodur.</i>	Elaboration provision
M:	<i>Aand, what comes out of the tree hollow?</i>	<i>Ve kovuktan ne çıkar?</i>	Elaboration request (closed-ended question)
C:	<i>An owl.</i>	<i>Baykuş.</i>	–
M:	<i>An owl.</i>	<i>Baykuş.</i>	Conversational talk (conversational repetition)
M:	<i>Mert got scared.</i>	<i>Mert çok korkar.</i>	Elaboration provision
M:	<i>And also asks (the owl): "I didn't mean to disturb you, Mr. Owl."</i>	<i>Ona da sorar: "Sizi rahatsız etmek istememiştim Bay Baykuş."</i>	Elaboration provision
M:	<i>"I was just looking for my frog!" he says.</i>	<i>"Sadece kurbağamı arıyodum." der.</i>	Elaboration provision
M:	<i>Meanwhile, the angry bees chase Doggy.</i>	<i>Bu arada da sinirlenen arılar Köpüş'ü kovalar.</i>	Elaboration provision
M:	<i>Now, the owl is also disturbed.</i>	<i>Baykuş da rahatsız olmuştur.</i>	Elaboration provision
M:	<i>(The owl) scares them for a while.</i>	<i>Onları bi süre korkutur.</i>	Elaboration provision
M:	<i>Then, Mert gets on top of a rock.</i>	<i>Sonraa Mert bi kayanın üstüne çıkar.</i>	Elaboration provision
M:	<i>He calls out from there.</i>	<i>Ordan seslenir.</i>	Elaboration provision

ANOVA comparisons within the cluster analysis indicated that these two storytelling styles were significantly different from one another in mothers' use of each discourse feature out of five (see Table 8). Accordingly, *storytellers* used provisions more frequently than *story builders*, while story builders outperformed storytellers in the other discourse features.

Table 7. *A storytelling script illustrating the story builder style of mothers.*

Speaker: Mother or Child	Utterance (in English)	Utterance (in Turkish)	Coded category
M:	<i>And...Look at these.</i>	<i>Ve... Şunlara bak.</i>	Conversational talk (attention moderator)
M:	<i>Do you think these are tree branches, Defne?</i>	<i>Şunlar ağaç dalı mı sence Defnecim?</i>	Elaboration request (closed-ended question)
C:	<i>Uh-uh (no)</i>	<i>I-ih (hayır anlamında)</i>	–
C:	<i>A deer.</i>	<i>Geyik.</i>	–
M:	<i>A deer?</i>	<i>Geyik mi?</i>	Conversational talk (conversational repetition)
M:	<i>Shall we see?</i>	<i>Bakalım mı?</i>	Conversational talk (attention moderator)
M:	<i>Aha Defne, it really is a deer!</i>	<i>Aha Defne, gerçekten geyikmiş o!</i>	Elaboration provision
M:	<i>And when (the deer) suddenly lifted her head up, (she) got Kerem on her head.</i>	<i>Ve bi anda kafasını kaldırıncı Kerem'i başının üzerine almış.</i>	Elaboration provision
M:	<i>And, she started running.</i>	<i>Ve koşmaya başlamış.</i>	Elaboration provision
M:	<i>What's on her head?</i>	<i>Kafasının üzerinde ne var?</i>	Elaboration request (open-ended question)
M:	<i>The deer must have been scared too, right?</i>	<i>Geyik de korkmuş olmalı, di mi?</i>	Elaboration provision (tag question)
M:	<i>They may fall off the cliff while running.</i>	<i>Uçurumdan düşebilirler, koşarken.</i>	Elaboration provision
M:	<i>Shall we see what happened?</i>	<i>Bakalım mı n'olmuş?</i>	Conversational talk (attention moderator)
M:	<i>Uh-huh, what happened Defne?</i>	<i>Hiih n'oldu Defne?</i>	Elaboration request (open-ended question)
C:	<i>(The deer) fell.</i>	<i>Düştü.</i>	–

In line with our assumptions, these results suggest that Turkish mothers adopted two distinct storytelling styles that varied in their use of interactive discourse features. However, it should be noted that all findings were independent of mothers' verbal input (i.e., narrative length) since we conducted these analyses with mothers' length-

proportioned discourse features. When comparing these two storytelling styles in terms of mothers' and children's verbal contributions, the results indicated that compared to *storytellers* ($M = 116.97$, $SD = 38.18$), *story builders* ($M = 179.19$, $SD = 64.69$) contributed more to the narrative conversation by their total number of utterances, $t(118) = 6.63$, $p < .001$; Cohen's $d = 1.17$ 95% CI [43.63, 80.79]. Interestingly, their children ($M = 35.19$, $SD = 19.44$) also produced more utterances than the children of storytellers ($M = 13.09$, $SD = 9.88$), $t(118) = 8.26$, $p < .001$; Cohen's $d = 1.43$ 95% CI [16.80, 27.39]. These underline that mothers' interactivity might enrich verbal input by promoting both mothers' own and their children's contributions.

Table 8. ANOVA results comparing storytelling styles in proportioned discourse features.

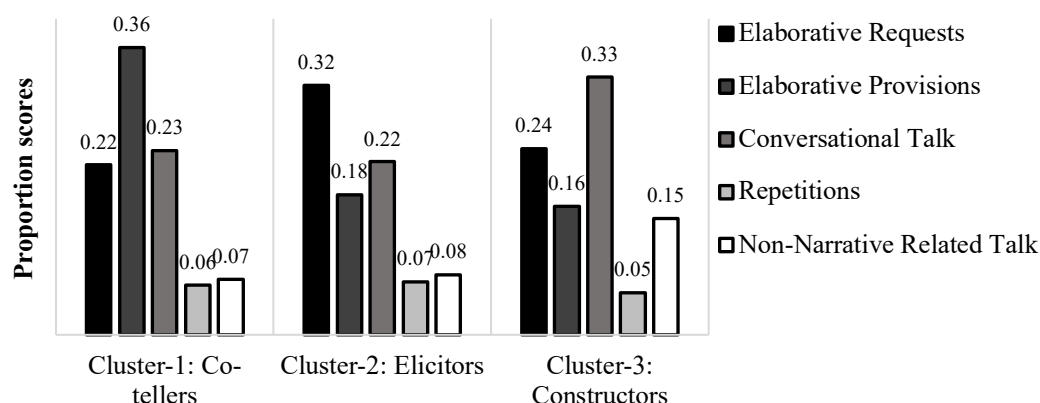
	Story Builders	Storytellers	F (1, 118)	Partial η^2
Discourse feature	M (SE)	M (SE)		
Elaboration provisions	.48 (.11)	.74 (.09)	203.82***	.63
Elaboration requests	.14 (.07)	.06 (.03)	81.43***	.41
Conversational talk	.20 (.06)	.10 (.05)	99.01***	.46
Repetitions	.06 (.03)	.04 (.02)	16.30***	.12
Nonnarrative related talk	.04 (.02)	.03 (.02)	4.07*	.03

* $p < .05$, ** $p < .01$, *** $p < .001$.

3.2.1.2 Reminiscing styles

The clustering procedure initially suggested a two-cluster solution with a 0.23 Silhouette index value. However, due to the risk of an artificial clustering process with a weak value, we opted to use the majority rule to decide on the final cluster solution. Out of 23 indexes, 10 suggested a three-cluster solution as optimal for clustering mothers into distinct reminiscing styles. All mothers were assigned to one of the three groups of style that significantly differ in their discourse pattern.

Figure 2. *Clusters of mothers' reminiscing styles.*



As presented in Figure 2, for the mothers in Cluster 1, 36% of their discourse consisted of elaboration provisions, and the rest consisted of 23% conversational talk, 22% elaboration requests, 6% repetitions, and 7% nonnarrative related talk. Of 120 mothers in our sample, 41 appeared in this cluster. These mothers, similar to *storytellers* in the storytelling context, used elaboration provisions most frequently than the other discourse features. However, they more frequently facilitated their children's contribution to the reminiscing conversation via conversational talk and elaboration requests. Thus, these mothers can be conceptualized as adopting a narrator form of reminiscing style with little effort to promote their children's participation. Accordingly, they were named *co-tellers* (see Table 9 for a script illustrating the co-teller style).

For the mothers in Cluster 2, most of their discourse (32%) was elaboration requests, while the rest consisted of 22% conversational talk, 18% elaboration provisions, 7% repetitions, and 8% nonnarrative related talk. Forty-six mothers appeared in this cluster. Compared to *co-tellers*, these mothers less frequently provided new information or personal evaluation for their children, whereas they used elaboration requests and conversational features more often. Given such an effort to elicit children's contributions to the memory conversations, these mothers can be conceptualized as active listeners of the reminiscing conversations in which they play active roles in children's memory reconstruction and narration. In line with previous findings (e.g., Leyva & Nolivós, 2015), they were called *elicitors* (see Table 10 for a script illustrating the elicitor style).

For the mothers in Cluster 3, most of their discourse (33%) was conversational talk, 24% elaboration requests, 16% elaboration provisions, 15% nonnarrative related talk, and 5% repetitions. There were 33 mothers in this cluster. Similar to *elicitors*, these mothers strived for their children's contributions to memory conversations. However, they prioritized keeping the flow of conversation over the information exchange. They frequently engaged in conversational turns for evaluating their children's responses or maintaining their attention to the memory conversation. Thus, they were conceptualized as equal conversational partners and named *constructors* consistent with previous findings (e.g., Carmiol et al., 2020) (see Table 11 for a script illustrating the constructor style).

Table 9. *A reminiscing script illustrating the co-teller style of mothers.*

Speaker: Mother or Child	Utterance (in English)	Utterance (in Turkish)	Coded category
M:	<i>We found all of them (the puzzle pieces).</i>	<i>Hepsini bulmuştuk.</i>	Elaboration provision
M:	<i>But we couldn't find one.</i>	<i>Ama bir tanesini bulamamıştık.</i>	Elaboration provision
C:	<i>And that one was in the stomach of the wolf.</i>	<i>O da kurtun midesindeymiş.</i>	—
M:	<i>But we left there very happy.</i>	<i>Ama çok mutlu ayrıldık ordan.</i>	Elaboration provision
M:	<i>We had so much fun.</i>	<i>Çok eğlenmiştik.</i>	Elaboration provision
M:	<i>Do you remember the puzzle, what picture it was?</i>	<i>Yapbozu hatırlıyor musun ne resmi olduğunu Mina?</i>	Elaboration request (closed-ended question)
C:	<i>A fish.</i>	<i>Balık.</i>	—
M:	<i>Yes.</i>	<i>Evet.</i>	Conversational talk (confirmation)
M:	<i>What piece of the fish could not we find?</i>	<i>Balığın hangi parçasını bulamamıştık?</i>	Elaboration request (open-ended question)
C:	<i>The ear.</i>	<i>Kulak.</i>	—
M:	<i>We couldn't find its ear.</i>	<i>Kulağını bulamamıştık.</i>	Conversational talk (conversational repetition)
M:	<i>It got into the wolf.</i>	<i>Kurdun içine girmiş.</i>	Elaboration provision
M:	<i>I think they put it in there by magic.</i>	<i>Sihirle içine soktular bence.</i>	Elaboration provision
M:	<i>Since you had looked inside the wolf, I didn't look there again.</i>	<i>Sen kurdun içine baktın diye ben tekrar bakmadım.</i>	Elaboration provision
C:	<i>No.</i>	<i>Yok.</i>	—

Table 10. *A reminiscing script illustrating the elicitor style of mothers.*

Speaker: Mother or Child	Utterance (in English)	Utterance (in Turkish)	Coded category
M:	<i>What puzzle was that?</i>	<i>Ne yapbozuydu o?</i>	Elaboration request (open-ended question)
C:	<i>A fish puzzle.</i>	<i>Balık yapbozu.</i>	–
M:	<i>That was a fish puzzle.</i>	<i>Balık yapbozuydu.</i>	Conversational talk (conversational repetition)
M:	<i>Where had we found the pieces?</i>	<i>Biz parçaları nerelerde bulmuştuk?</i>	Elaboration request (open-ended question)
C:	<i>I can't remember in that way.</i>	<i>Öyle hatırlayamam.</i>	–
M:	<i>Then, was there any behind the door?</i>	<i>Peki kapının arkasında var mıydı?</i>	Elaboration request (closed-ended question)
C:	<i>There waaas.</i>	<i>Vaaa (r).</i>	–
M:	<i>Where else?</i>	<i>Başkaa?</i>	Elaboration request (memory prompt)
M:	<i>Was there a piece under the heater?</i>	<i>Kaloriferin altında bir parça var mıydı?</i>	Elaboration request (closed-ended question)
C:	<i>There was.</i>	<i>Vay (r).</i>	–
M:	<i>OK.</i>	<i>Peki.</i>	Conversational talk (confirmation)
M:	<i>What was the name of Elif's fish?</i>	<i>Elif ablanın balığının adı neydi?</i>	Elaboration request (open-ended question)
M:	<i>You know, that's something that is eaten "crack crack crack", what?</i>	<i>Hani bi tane böyle "kır kır kır kır" yenen bi şey, neydi?</i>	Elaboration request (fill- in-the-blank question)
C:	<i>Cracker!</i>	<i>Kyakey (r)!</i>	–

ANOVA comparisons within the cluster analysis indicated that these three styles of mothers were significantly different from one another in mothers' use of four discourse features out of five (see Table 12). Post-hoc comparisons showed that *co-tellers* used provisions more frequently than the two groups, *elicitors* used more elaboration requests than the other groups, and *constructors* outperformed the others in using conversation talk. However, these three styles did not differ in mothers' use of repetitions.

In line with our assumptions, the results suggest that Turkish mothers adopted three distinct reminiscing styles varied in their level of interactivity. Importantly, these findings were independent of mothers' narrative length as they all were conducted with mothers' length-proportioned discourse features. When comparing these three reminiscing styles in terms of mothers' and children's individual contributions, the

results showed that *elicitors* did not significantly differ from either *constructors* or *co-tellers* in terms of narrative length. Likewise, their children's contributions were also not different from the children of either group. However, compared to *co-teller* mothers ($M = 58.56$, $SD = 24.52$), *constructors* ($M = 79.39$, $SD = 44.77$) contributed more to the memory conversation by their total number of utterances, $F(2, 117) = 3.12$, $p = .048$, partial $\eta^2 = .05$. Their children ($M = 31.39$, $SD = 16.10$) also produced more utterances than the children of co-tellers ($M = 19.83$, $SD = 10.75$), $F(2, 117) = 7.10$, $p = .001$, partial $\eta^2 = .11$. Given the constructor style featured more interactive than the co-teller one, these findings suggest mothers' interactivity level in narrative conversations as facilitating both mothers' own and their children's contributions.

Table 11. *A reminiscing script illustrating the constructor style of mothers.*

Speaker: Mother or Child	Utterance (in English)	Utterance (in Turkish)	Coded category
M:	<i>Look at our picture!</i>	<i>Fotoğrafımıza baksana!</i>	Conversational talk (attention moderator)
C:	<i>Elif took our picture.</i>	<i>Elif abla bizi çekmişti.</i>	–
M:	<i>Yes.</i>	<i>Evet.</i>	Conversational talk (confirmation)
C:	<i>Here is the fish!</i>	<i>Balık burdaymış!</i>	–
M:	<i>There was the fish.</i>	<i>Balık ordaymış.</i>	Conversational talk (conversational repetition)
C:	<i>And we found its pieces.</i>	<i>Biz de parçalarını bulmuşuz.</i>	–
M:	<i>Yes.</i>	<i>Evet.</i>	Conversational talk (confirmation)
M:	<i>Do you remember any of the places?</i>	<i>Hiç hatırladığın bi yer var mı?</i>	Elaboration request (memory prompt)
C:	<i>Uh-uh (no).</i>	<i>İı-ıh (hayır anlamında).</i>	–
M:	<i>Perhaps one of them was behind the door.</i>	<i>Bi tanesi kapının arkasındaydı sanki.</i>	Elaboration provision
C:	<i>Yes.</i>	<i>Evet.</i>	–
M:	<i>Then had we retrieved one from in one of the toys?</i>	<i>Sonra birini, oyuncaklardan birinin içinden mi almıştık?</i>	Elaboration request (closed-ended question)
M:	<i>Someone had eaten it.</i>	<i>Biri yemişti onu.</i>	Elaboration provision
C:	<i>The wolf.</i>	<i>Kurt.</i>	–
M:	<i>The wolf had eaten it?</i>	<i>Kurt mu yemiştii?</i>	Conversational talk (conversational repetition)
C:	<i>Huh-huh (yes).</i>	<i>Hı-hı (evet anlamında).</i>	–

Table 12. ANOVA results comparing reminiscing styles in proportioned discourse features.

	Co-tellers	Elicitors	Constructors	F (2, 117)	Partial η^2
Discourse feature	M (SE)	M (SE)	M (SE)		
Elaboration provisions	.36 (.07)	.18 (.07)	.16 (.06)	110.69***	.65
Elaboration requests	.21 (.05)	.32 (.09)	.24 (.06)	23.97***	.29
Conversational talk	.23 (.06)	.22 (.07)	.32 (.09)	22.09***	.27
Repetitions	.06 (.01)	.07 (.01)	.05 (.01)	1.25	.02
Nonnarrative related talk	.07 (.06)	.08 (.05)	.15 (.09)	14.74***	.20

* $p < .05$, ** $p < .01$, *** $p < .001$.

3.2.1.3 Maternal discourse styles by mother and child variables

Prior to the analyses testing the relations between maternal styles and children's outcomes, we investigated variables that could be potentially associated with mothers' assuming of a discourse style. Based on significant findings in previous research and the current study's preliminary analyses, mothers' membership of storytelling and reminiscing styles was examined by their level of education, as well as by children's age and gender. A set of chi-square tests yielded that the style that mothers adopted in either context did not vary by child gender, while mothers' storytelling styles significantly differed by child's age, $\chi^2 (2, N = 120) = 6.71, p = .04$. Specifically, the *storyteller* style was adopted more by the mothers of 5-year-olds (81.1% of them), but almost equally by the mothers of 3- (58% of them) and 4-year-olds (55% of them). Moreover, not storytelling styles but mothers' membership of reminiscing styles changed by their education level, $\chi^2 (6, N = 120) = 12.82, p = .046$. While mothers with bachelor's and graduate degrees were equally assigned to the three reminiscing styles, mothers with high-school degrees showed an inclination to adopt the narrator reminiscing style (i.e., 60% of them were *co-tellers*), and at the same time, they were less likely to adopt the interactive reminiscing style (i.e., only 6.7% of them were *elicitors*).

In addition to the mother and child demographics, the current study also assessed mother-child literacy routines and their frequency of reminiscing about the 'treasure

hunt' game to check possible relations with mothers' assuming a style in the relevant context. However, the two storytelling styles were similar in their frequency of narrating a book with their children in daily life ($p = .41$). Likewise, the three reminiscing styles were not different from each other in how frequently they reminisced about the game ($p = .56$). In the light of these findings, the current study included maternal education and children's age as potential predictors for children's PT skills in addition to maternal styles. Due to the lack of relation with either child outcomes or maternal styles, child gender was not further included in our analyses.

3.2.2 Second research question of the study: Maternal discourse styles in relation to children's perspective-taking

This section presents the findings regarding the second research question. We hypothesized that mothers' storytelling and reminiscing styles, especially the ones featured as interactive, would contribute to children's perspective-taking (PT) abilities. To test it, we conducted separate multiple linear regression analyses that predict children's visual PT, syntactic PT, and FB understanding scores within each narrative context. There were six regression models. Each model included children's age-in-months and vocabulary scores (i.e., the aggregate score of expressive and receptive vocabulary tasks) as continuous predictors, and mothers' education and discourse styles as dummy-coded predictors. The narrator style in each context (i.e., storytelling: *storytellers*; reminiscing: *co-tellers*) was regarded as the baseline group of the relevant context.

As presented in Table 13 and Table 14, all models were significant, $ps < .001$. While mothers' education level did not contribute to any model, children's age ($\beta_{\text{min-max}} = .39 - .65$) and vocabulary skills ($\beta_{\text{min-max}} = .26 - .33$) significantly contributed to each model and positively predicted children's PT abilities. The results partially confirmed our hypothesis and yielded significant contributions of mothers' interactive discourse styles to children's PT. First, mothers' styles in each context significantly contributed to the models predicting children's visual PT abilities. Specifically, children whose mothers were *elicitors* when talking about memories scored higher than children whose mothers were *co-tellers* ($\beta = .19, p = .050$). However, contrary to our expectation, children whose

mothers were *storytellers* when talking about a storybook performed better than children whose mothers were *story builders* ($\beta = -.17, p = .045$).

The regressions predicting children's FB understanding did not confirm our expectations. Neither maternal storytelling nor reminiscing styles significantly contributed to the variance in children's FB scores. However, the analyses on children's syntactic PT scores yielded significant contributions of maternal styles in the storytelling context. In detail, children whose mothers were *storytellers* during storytelling outperformed children whose mothers were *story builders* ($\beta = .16, p = .043$). There was no significant contribution of maternal reminiscing styles to the model predicting children's syntactic PT abilities.

Table 13. Multiple Regression Analyses predicting children's outcomes with maternal storytelling styles (Baseline group: storyteller).

Child outcome	Predictors	Standardized coefficients		R^2	F	p
		β	p			
Visual PT	(Constant)		<.001	.26	10.09	<.001
	Mother education	.04	.60			
	Child age-in-months	.39	<.001			
	Child vocabulary	.26	.003			
	Story builder	-.17	.045			
FB	(Constant)		<.001	.50	28.38	<.001
	Mother education	.03	.71			
	Child age-in-months	.64	<.001			
	Child vocabulary	.30	<.001			
	Story builder	-.09	.21			
Syntactic PT	(Constant)		.001	.37	15.31	<.001
	Mother education	-.05	.58			
	Child age-in-months	.47	<.001			
	Child vocabulary	.31	<.001			
	Story builder	-.16	.043			

Child vocabulary: The aggregate of receptive and expressive vocabulary tasks; Visual PT: The standardized aggregate of visual perspective-taking tasks; Syntactic PT: The score of syntactic complementation task; FB: the aggregate score of false belief tasks.

Table 14. *Multiple Regression Analyses predicting children's outcomes with maternal reminiscing styles (Baseline group: co-teller).*

Child outcome	Predictors	Standardized coefficients		R^2	F	p
		β	p			
Visual PT	(Constant)		<.001	.26	7.98	<.001
	Mother education	-.03	.72			
	Child age-in-months	.43	<.001			
	Child vocabulary	.28	.001			
	Constructor	.11	.24			
	Elicitor	.19	.050			
FB	(Constant)		<.001	.49	21.98	<.001
	Mother education	.02	.77			
	Child age-in-months	.65	<.001			
	Child vocabulary	.31	<.001			
	Constructor	-.04	.60			
	Elicitor	-.03	.75			
Syntactic PT	(Constant)		<.001	.35	11.45	<.001
	Mother education	-.08	.35			
	Child age-in-months	.52	<.001			
	Child vocabulary	.33	<.001			
	Constructor	-.07	.42			
	Elicitor	.05	.57			

Child vocabulary: The aggregate of receptive and expressive vocabulary tasks; Visual PT: The standardized aggregate of visual perspective-taking tasks; Syntactic PT: The score of syntactic complementation task; FB: the aggregate score of false belief tasks.

Taken together, these findings revealed the significant contributions of maternal discourse styles to children's visual and syntactic PT. However, the results varying by context underline mothers' context-specific and unique ways of scaffolding their children's abilities. While mothers' assuming an interactive reminiscing style positively contributed to children's abilities to comprehend one's visual perspective, they promoted such understanding with a narrator or didactic way when they narrate a storybook with their children. Similarly, contextual differences were reflected in the findings with syntactic PT, and mothers' narrator styles contributed to children's syntactic comprehension of perspectives only within a literacy-based context (i.e., storytelling). Such variance in both assuming and functioning of maternal discourse styles suggests the importance of examining maternal discourse styles as a combination of the contextually unique and sensitive way of scaffolding for children's abilities.

3.2.3 Additional Analyses

Although the current study investigated maternal discourse styles in association with children's PT abilities separately in storytelling and reminiscing conversations, by several methodological novelties, the comparability of the two contexts was increased in terms of structure and familiarity with their content. Maternal styles, which were exploratory for each context, hindered clear expectations regarding the same mothers' discourse styles across storytelling and reminiscing. Thus, following our main findings we run several additional analyses to examine the consistency or shifts in the same mothers' discourse styles across the two contexts and its relation to children's perspective-taking.

In Table 15, the shifts in mothers' discourse styles across storytelling and reminiscing narratives were presented. Accordingly, 40% of the mothers who adopted the *storyteller* style during storytelling maintained their predominant narrator role across the contexts by assuming the *co-teller* style in reminiscing conversations (i.e., the combination of *storyteller-co-teller*). However, the remaining 60% changed their narrator style and shifted to one of the interactive styles in reminiscing conversations: the combination of *storyteller-elicitor* ($n = 28$), and the combination of *storyteller-constructor* ($n = 18$). Of the mothers who assumed the relatively interactive storytelling style, 77% maintained or boosted their interactive style across the contexts and appeared in one of the interactive styles in reminiscing conversations: the combination of *story builder-elicitor* ($n = 18$), and the combination of *story builder-constructor* ($n = 15$). Only the remaining 23% shifted to the narrator reminiscing style (i.e., the combination of *story builder-co-teller*).

These results showed that most mothers in our sample adopted a narrator role in storytelling, while they shifted to interactive styles and shared the narration responsibility with their children when talking about memories. In support of this conclusion, mothers' and children's contributions to the narrative conversation were calculated in each context (i.e., individual number of utterances/total number of utterances). Children's individual contributions to the total storytelling conversation were 12%, while it increased to 27% in reminiscing conversations.

Table 15. *The Distribution of maternal discourse styles across storytelling and reminiscing by child age group.*

		Co-teller	Elicitor	Constructor	Total
Story Builder	3-year-olds	4	9	6	19
	4-year-olds	3	7	7	17
	5-year-olds	3	2	2	7
	Total	10	18	15	43
Storyteller	3-year-olds	9	13	4	26
	4-year-olds	10	6	5	21
	5-year-olds	12	9	9	30
	Total	31	28	18	77
Total		41	46	33	120

Our finding that the mothers either remained or shifted between the narrator and interactive styles across storytelling and reminiscing led us to investigate how children's perspective-taking (PT) scores would be related to mothers' assuming a 'narrator' versus 'interactive' style in each context. The current study explored two storytelling styles (*storyteller* and *story builder*) each attributed as narrator and interactive. However, the reminiscing context unfolded two forms of interactive styles (*elicitor* and *constructor*) in addition to a predominantly narrator style (*co-teller*). Thus, we further asked if the relations between maternal reminiscing styles and children's PT scores would be parallel when collapsing elicitor and constructor styles across one interactive reminiscing style. Through the collapsed interactive style, obtaining conceptually identical styles in each context would also allow us to contrast the same mothers' assuming a narrator versus interactive styles across storytelling and reminiscing.

A set of 2 [storytelling styles: narrator, interactive] x 2 [reminiscing styles: narrator, interactive] between-subjects ANCOVAs was conducted separately for each child outcome to test whether there was a significant effect of mothers' assuming a narrator versus interactive styles across two narrative contexts on children's PT scores controlling for their age and vocabulary skills. The results mirrored our previous regression findings (see Table 16, 17 and 18). The post-hoc comparisons indicated that children of interactive mothers in storytelling ($M = -.67$, $SE = .25$) scored lower in visual PT tasks compared to children of the narrators ($M = .17$, $SE = .16$, $p = .006$), whereas children of interactive mothers in reminiscing ($M = .14$, $SE = .16$) outperformed children

of the narrators ($M = -.64$, $SE = .25$, $p = .01$). Consistent with our previous findings, we found no significant difference in children's false belief (FB) scores depending on mothers' storytelling or reminiscing styles. However, children's syntactic PT scores showed small variances depending on mothers' storytelling styles. As previously evidenced, children of the narrator mothers ($M = 10.98$, $SE = .41$) performed marginally better than children of the interactive mothers. ($M = 9.4$, $SE = .65$, $p = .043$).

In conclusion, these analyses confirmed our previous findings on the context-specific relations between maternal discourse styles and children's PT abilities. Specifically, mothers' assuming an interactive style when talking about personal memories with their children, but their assuming of a narrator style when narrating fictional stories were associated with children's better visual PT abilities. While children's FB understanding did not differ by their mothers' discourse styles in any context, mothers' narrator style during storytelling contributed to children's perspectival understanding through syntactic structures. We should also note that there was no interaction effect of mothers' styles in each narrative context on children's outcomes. All these findings suggest mothers' unique and independent ways of verbal scaffolding that are individually and contextually distinct for children's comprehension of perspectival differences.

Table 16. *Two-way ANCOVA results on children's visual PT scores controlling for child age and vocabulary.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Partial η^2
Intercept	69.79	1	69.79	36.82***	.25
Child age-in-months	.75	1	.75	0.39	.00
Child vocabulary	33.93	1	33.93	17.9***	.14
Mother storytelling style	14.83	1	14.83	7.82**	.07
Mother reminiscing style	12.94	1	12.94	6.83*	.06
Mother storytelling X reminiscing style	5.11	1	5.11	2.70	.02
Error	214.21	113	1.90		

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 17. Two-way ANCOVA results on children's false belief (FB) scores controlling for child age and vocabulary.

Source	Sum of Squares	df	Mean Square	F	Partial η^2
Intercept	32.12	1	32.12	32.82***	.22
Child age-in-months	11.69	1	11.69	11.94**	.10
Child vocabulary	18.95	1	18.95	19.37***	.15
Mother storytelling style	.82	1	.82	.84	.01
Mother reminiscing style	.16	1	.16	.17	.00
Mother storytelling X reminiscing style	.06	1	.06	.06	.00
Error	111.57	114	.98		

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 18. Two-way ANCOVA results on children's syntactic PT scores controlling for child age and vocabulary.

Source	Sum of Squares	df	Mean Square	F	Partial η^2
Intercept	16.34	1	16.34	1.43	.01
Child age-in-months	11.62	1	11.62	1.02	.01
Child vocabulary	320.84	1	320.84	28.05***	.21
Mother storytelling style	47.93	1	47.93	4.19*	.04
Mother reminiscing style	.04	1	.04	.00	.00
Mother storytelling X reminiscing style	1.05	1	1.05	.09	.00
Error	1200.96	105	11.44		

* $p < .05$, ** $p < .01$, *** $p < .001$.

CHAPTER 4

DISCUSSION

The current study aimed to investigate mothers' discourse styles in mother-child storytelling and reminiscing conversations, and the relations between mothers' discourse styles and children's perspective-taking (PT). In the first part, two separate cluster analyses were conducted to explore mothers' discourse styles in each narrative context. These analyses assigned mothers into groups of style naturally emerging out of individual discourse patterns which consisted of their length-proportioned frequencies of using five discourse features (elaboration provisions, elaboration requests, conversational talk, repetitions, nonnarrative related talk). In the second part, mothers' discourse styles were examined in relation to children's PT abilities. To test whether mothers' storytelling and reminiscing styles would contribute to children's abilities of PT, separate multiple regressions were performed for each context to predict each child outcome (visual PT, false belief understanding, syntactic PT). Maternal education, children's age, and vocabulary skills were also included as predictors in all regression analyses. Lastly, additional analyses for exploratory purposes were conducted to compare mothers' assuming of a narrator versus interactive style across storytelling and reminiscing contexts and to examine the effects of mothers' context-related discourse consistency or change on children's PT abilities.

4.1 Findings regarding the first research question

Addressing our research question on mothers' discourse styles, the analyses identified two maternal storytelling styles (*storyteller*, *story builder*) and three reminiscing styles (*co-teller*, *elicitor*, and *constructor*). The results confirmed our expectations and extended the line of research from culturally diverse samples including Turkish that have distinguished mothers' discourse styles only in terms of the extent to which they introduced the new narrative or personal information to the conversation (i.e., elaborations) (e.g., Haden & Fivush, 1996; Fivush et al., 2006; Sahin-Acar & Leichtman, 2015; Wang, 2007). Our findings suggest that in addition to the extent to which mothers elaborated, their discourse styles in each context were distinct in their level of interactivity which refers to their assuming of a narrative role to share with their children. In agreement with the existing research that has been mostly conducted with Spanish-speaking samples (e.g., Carmiol et al., 2022; Melzi et al., 2011), Turkish mothers varied in the way in which they incorporated elaborations into the narratives (both provision and request), and in their use of conversational talk to direct their children's attention and contributions.

Similar to maternal storytelling styles identified with some European and non-European samples (Leyva et al., 2021 with Indian, German, and American dyads; Melzi & Caspe, 2005 with Peruvian dyads; Nieto et al., 2019 with Guatemalan-Mayan dyads), *storyteller* and *story builder* mothers were different in how frequently they promoted their children's contribution to the narrative conversations by individual variances in their use of narrative provisions and requests, as well as other conversational elements (e.g., evaluations, attention moderators). *Storytellers* as the narrators of the storytelling conversations dominantly provided elaborations for their children but used other discourse features very rarely. In contrast, *story builders* had a balanced use of elaboration provisions and requests, and conversational talk. Thus, these mothers can be described as adopting the interactive mode of storytelling in which children were invited to collectively build the narrative conversation through mothers' frequent questions and conversational markers. In turn, their children had an increased amount of verbal contribution to these conversations (e.g., Escobar et al., 2017). In support of this, our

results also indicated that children of story builders contributed to the narrative conversation by their total number of utterances greater than children of storytellers.

When the same mothers conversed with their children about the shared past event, there were three distinct styles of mothers. In agreement with the previous work (e.g., Haden 1998 with European-American dyads; Leyva & Nolivos 2015 with Chilean dyads), these reminiscing styles were distinguished by mothers' level of interactivity, that is their discourse strategies to determine the shared roles of both conversation partners. *Elicitors* predominantly posed elaboration requests to actively support their children's elicitation of the memory, whereas *constructors*' most dominant discourse feature was conversational talk through which they maintained the reciprocity of the conversation such as evaluating their children's responses or getting their attention to the conversation. Despite their different dominant characteristics, both groups of mothers commonly encouraged their children's active engagement or verbal contributions to memory reconstruction by frequent use of interactive discourse features rather than readily providing them with most of the memory content. Given such efforts to jointly build memory conversations, these two groups of mothers can be conceptualized as adopting an interactive reminiscing style.

The third group of mothers, *co-tellers*, assumed a narrator reminiscing style. Similar to the declarative style of mothers in Haden's study (1998), these mothers dominantly provided their children with most of the memory elaborations instead of asking for their contributions. This reminiscing style is different from the didactic style in the study of Leyva and Nolivos (2015) since the co-teller style dictates the content of the memory rather than teaching children lessons about life or unrelated content. However, it should be noted that the didactic reminiscing style was identified with mother-child elicitation of their negatively-charged memories (i.e., their experience of emotionally upsetting events in the past). The current study elicited mother-child reminiscing conversations about a semi-structured and emotionally neutral or positive past event, which may result in mothers' adopting the main narrator role. Due to differences in the structure and valence of the event, these mothers may see their job as conveying the most comprehensive and accurate memory to complete the reminiscing activity.

Another explanation for mothers' assuming of a narrator style in reminiscing might be their education level. Consistent with Kuntay and Ahtam's (2004) findings, our results showed a significant effect of maternal education level on their assuming a reminiscing style. While mothers with bachelor's and graduate degrees were equally assigned to the three reminiscing styles, mothers with high-school degrees showed an inclination to adopt the narrator reminiscing style. This suggests that even with a highly -educated sample of mothers (84.2% had a university degree or above), education may affect mothers' tendency to show more or less interactive discourse patterns during reminiscing interactions.

In support of co-tellers' dominant narrator roles in reminiscing, our comparisons by children's total number of utterances indicated that their children made a few verbal contributions to memory conversations. In this sense, the co-teller reminiscing style was a similar construal of the storyteller style in storytelling. Given the storytelling and reminiscing styles identified in the current study, one might conclude that Turkish mothers similarly assumed either the narrator or interactive style in both contexts. However, it is worthwhile to discuss mothers' rate of distribution to the styles in one context along with the consistency or change in their discourse styles across the storytelling and reminiscing conversations.

In the current study, most mothers appeared in the narrator style (i.e., storyteller) when narrating a storybook with their children. Sixty percent of these mothers shifted their narrator style to one of the interactive styles when reminiscing about a shared memory with their children. This pattern of shift mirrored the previous findings regarding Latin-American mothers' situation-centered approaches (e.g., Carmiol et al., 2022; Melzi et al., 2011). According to one perspective of the sociocultural account, culturally distinct values and norms shape the manner of caregiver-child conversations. Based on this culturally distinct narrative socialization process, in some cultures, the narrative roles of both conversation parties are assigned depending on the conversation context. Studies have shown that compared to European-Americans, Latin-American mothers mostly reflected cultural socialization goals that differ by the discourse context, namely the situation-centered approach (e.g., Eisenberg, 1985; Rogoff, 2003). In this respect,

similar to Spanish-speaking mothers, Turkish-speaking mothers may perceive storytelling as an expert-dominant narrative activity in which the most competent partner dominates the flow of conversation. In contrast, they might see reminiscing as a shared platform that allows for the collaborative reconstruction and retrieval of memory (e.g., Fivush & Nelson, 2006; Nelson, 2007; Wang, 2007).

Approximately 50% of the mothers in the current study were found to maintain their styles across storytelling and reminiscing conversations. Specifically, 31 mothers have maintained their narrator styles, and 33 mothers have maintained their interactive styles across both contexts. This pattern of consistency mostly captured within the European-American parent-child dyads might reflect intra-cultural differences in parents' individual socialization goals (Sahin-Acar & Leichtman, 2015; Wang et al., 2000). Accordingly, the consistency in maternal discourse styles may stem from individual goals and motivations that mothers aim to similarly accomplish across different contexts. Depending on cultural and personal drives, for instance, they might perceive narrative interactions as an educational activity to support children's school readiness, a tool for recreation and entertainment, or as an effective emotional source to strengthen the bonding between parents and children (Kulkofsky et al., 2009; Leyva et al., 2021; Luo et al., 2014). How mothers conceptualize the functioning of these narrative contexts may also affect how they participate in the relevant interaction (Fivush & Haden, 2003; Nelson, 2007). Thus, it is important to address maternal discourse styles along with their goals and perceived functions across different forms of narratives.

The last group of mothers has been found to show an unexpected pattern of discourse changing across the two narrative contexts. These mothers ($n = 10$) who were relatively interactive during storytelling interactions shifted to narrator styles when reminiscing with their children. Such shifts may arise from the design of the current study. In the reminiscing literature, mother-child dyads have been commonly asked to talk about their individually-determined memories (e.g., Haden, 1998; Wang & Fivush 2005). The structured nature of the event to reminisce in the current study might elicit mothers' talk in a more structured and didactic manner compared to naturally experienced and elicited

mother-child reminiscing conversations. Mothers might feel pressure to have the most complete reconstruction of the memory that others know about.

Taken together, our findings regarding the exploration of Turkish mothers' discourse styles across storytelling and reminiscing contexts have contributed to both national and international lines of research. We extended culturally limited and mixed findings by showing both individually and contextually unique patterns of maternal discourse, which determines mothers' and children's participation roles in these narrative interactions. In this sense, maternal discourse styles that shape children's cognitive and verbal engagement in narratives would provide children with a sensitive and adaptive scaffolding for their linguistic and social understanding.

4.2 Findings regarding the second research question

With regard to the second research question, the current study investigated how mothers' storytelling and reminiscing styles were related to children's perspective-taking abilities. Our hypotheses could not clearly define contextual nuances due to the lack of research evidencing links between maternal discourse styles and children's perspective-taking (PT) abilities in various contexts. However, given narrative conversations as a tool for perspectival exchange and discussion (de Rosnay & Hughes, 2006; Harris 2005), we still expected that mothers' interactive discourse styles in each context would promote children's verbal and cognitive engagement in narrative conversations and positively contribute to children's visual, socio-cognitive (i.e., false belief understanding), and syntactic PT abilities.

Previous work has evidenced the extent to which mothers' use of elaboration in reminiscing conversations contributes to children's visual PT. As converging with the findings of Reese and Cleveland (2006), our results have shown significant relations between mothers' reminiscing styles and children's visual PT. The current study extended the existing findings by indicating in this relation the significant role of the *ways* in which mothers elaborated and promoted their children's participation. In detail, children whose mothers were *elicitors* in reminiscing had higher scores in visual PT tasks than children whose mothers were *co-tellers*. Accordingly, mothers who

dominantly asked for their children's contributions to memory reconstruction seem to promote children's comprehension of perspectival differences based on visual clues. Unexpectedly, children's visual PT scores were not associated with mothers' assuming the *constructor* reminiscing style characterized by mothers' inclination to maintain the flow of conversation. These results imply that children's perspectival understanding through reminiscing conversations can be better scaffolded by mothers' requests for children's informative and perspectival contributions to collective remembering over the maternal effort to maintain reciprocity in memory conversations.

The analyses to test our relevant hypotheses have shown mothers' storytelling styles also significantly contributed to children's visual PT abilities. Contrary to the hypothesized direction, however, children whose mothers adopted the narrator style in storytelling conversations (i.e., *storyteller*) performed better than children whose mothers adopted the more interactive storytelling style (i.e., *story builder*). For the reversed pattern of mothers' storytelling styles in predicting children's abilities, one explanation might be the distinct pathways of maternal scaffolding through culturally shaped and socialized narrative interactions. To illustrate, children's higher literacy performances were associated with mothers' interactive storytelling styles in European-American samples (e.g., Haden et al., 1996), but with narrator styles for Latin-American mother-child dyads (Caspe, 2009).

More importantly, given that children's higher visual PT scores were associated with mothers' assuming an interactive style in the reminiscing context, our results suggest mothers' context-dependent narrative scaffolding which adaptively functions to children's benefit. Despite the current study's adjustments to increase the comparability in discourse structure across storytelling and reminiscing, these contexts are naturally distinct in the way multiple perspectives are presented and discussed. In reminiscing, each speaker takes an individual role to recount the past, and the exchange of perspectives on the past mostly takes place through the back-and-forth between two speakers (Fivush et al., 2006; Nelson, 2007). However, when conversing about a storybook each speaker can convey various perspectives through little back-and-forth. In that respect, narrator mothers in storytelling might promote their children's insight into

the mental worlds by providing all perspectives of their own and the story characters by themselves rather than exchanging with them in conversational turns.

Our hypothesis regarding the link between maternal discourse styles and children's false belief understanding was not confirmed. Contrary to the previous evidence (e.g., Ontai & Thompson, 2008; Welch-Ross, 1997), the current study has shown that children's ability to comprehend conflicting beliefs was independent of their mothers' storytelling and reminiscing styles. The lack of relation consistently indicated across different methods of analyses (i.e., multiple regressions, ANOVA) might be partially due to the current study's use of children's total scores on various FB tasks as an outcome variable. Although aggregating children's performances on different but correlated FB tasks is a common practice in the relevant literature (e.g., Reese & Cleveland, 2006), we should note that each task demands children's different levels of cognitive achievement (Perner et al., 2002; Tomasello, 2019). First-order FB tasks require children to represent one's perspective conflicting with reality, while second-order FB tasks require simultaneous coordination of one person's perspective conflicting with reality based on another person's perspective. In appearance-reality tasks, however, children are required to coordinate the change in their own perspectives by the time that are presently conflicted with reality. In this case, it is plausible to expect that children whose mothers frequently requested their elaborations on past experiences or perspectives would be more capable of appearance-reality reasoning.

Another explanation could be the existence of cognitive factors mediating the relation between children's FB understanding and maternal discourse styles. Compared to visual PT, children's understanding of FB as a more sophisticated and advanced form of PT is closely related to other cognitive skills. A line of research has shown that children's memory skills predicted their abilities to simultaneously consider present and past perspectives (e.g., Lu et al., 2008; Naito, 2003; Perner et al., 2007). It has been also documented that mothers' elaborative style of talk that promotes children's participation via questions and evaluations was associated with children's concurrent and longitudinal memory outcomes (e.g., Leichtman et al., 2000; Reese et al. 2003) (see Wu & Jobson, 2019 for a meta-analysis). In this case, one might argue that maternal discourse would

differentially contribute to children's FB understanding depending on their memory capacities. Longitudinal research with multiple mother and child factors would give better insight into the indirect links between maternal discourse and children's comprehension of FB.

Another important finding of the current study has revealed that children's syntactic PT abilities were not associated with maternal styles in reminiscing but related to their styles in storytelling. In contrast to our expectation, this relation was also in favor of mothers' assuming the narrator style when talking about a storybook with their children. As a linguistic form of social understanding, children's syntactic comprehension might be promoted by mothers' elaborations of multiple perspectives (e.g., Tay & Ding, 2022). However, context-specific relations in the current study might be due to the unique features of the storytelling act. When comparing mothers' narrative length across the two contexts, all mothers talked more in storytelling than reminiscing. In this sense, storytelling as a structured literacy-based narrative activity might elicit mothers' more sophisticated language that embedded different perspectives into the syntactic structures more frequently than the more basic and causal mode of reminiscing (e.g., Crain-Thoreson et al., 2001; Demir-Lira et al., 2018). Indeed, recent research has evidenced that Turkish mothers' use of complementation was very frequent and diverse during mother-child storytelling interactions (Ilgaz et al., 2021).

Furthermore, our analyses showed that mothers of older children were more likely to adopt the narrator style during storytelling. Thus, it is also plausible that the narrators whose children were older and presumably more attentive and competent might provide their children with more complex and embellished language (Hammer et al., 2010). Despite the lack of evidence on maternal language complexity, the current study constitutes the first to show the role of maternal discourse styles on children's perspectival understanding through syntactic structures.

Taken together, the current study has shown children's increased abilities for visual and syntactic PT depending on maternal storytelling and reminiscing styles. Specifically, mothers' narrator styles during storytelling conversations were positively related to children's performance. When considering mothers' styles across narrative contexts as

the degree to which they are interactive, the analyses with collapsed reminiscing styles of elicitor and constructor have also indicated that children of mothers who adopted the interactive reminiscing style (either elicitor or constructor) outperformed children of mothers who were the narrator of the reminiscing conversations. Given the lack of interaction between maternal styles across the two contexts on children's outcomes, our results suggest mothers' context-specific but independent ways of scaffolding their children's perspective-taking through narrative conversations. Based on such adaptive scaffolding varying by mother, child, and contextual factors, it is difficult to define stringent maternal styles that prove beneficial above and beyond all contexts and circumstances.

4.3 Contributions, limitations, and directions for future research

The current study made several unique contributions to the existing literature. First, a comprehensive approach was utilized to examine mothers' discourse patterns in storytelling and reminiscing conversations. Adding to the previous research concentrated on the extent to which mothers use of total elaborations (i.e., regardless of the form of elaboration), the current study has examined Turkish-speaking mothers' discourse styles in terms of their use of interactive discourse features that differentiate both maternal and children's participation roles in these narrative conversations. Most mothers adopted distinct roles varying across storytelling and reminiscing conversations, and those who adopted more interactive styles in either context had children who contributed more to the particular narrative context. By examining Turkish mothers' discourse styles in two narrative contexts, the current study also constitutes the first in the national line of research and gives important insight into Turkish mothers' narrative roles and narrative socialization through different modes of mother-child daily discourse.

In line with the conceptualization of discourse styles as scaffolding strategies (e.g., Fivush et al., 2006; Nelson 2007), the current study's investigation of the relations between maternal styles and preschoolers' perspective-taking (PT) has contributed to the extant literature in various ways. Prior work on links between maternal talk and children's abilities PT has mostly concentrated on children's understanding of false belief (FB) or 'theory of mind' as an aggregated construct of various PT abilities. This

study constitutes the first to examine maternal discourse styles in association with children's syntactic PT abilities along with their visual PT and FB understanding. Additionally, it also suggests mothers' adaptive scaffolding which reflected on their context-specific patterns of relations with children's PT abilities. Mothers' assuming an interactive style when talking about past experiences, but their narrator style when narrating a fictional story was associated with preschoolers' higher visual and syntactic PT abilities.

Importantly, the current study adds to the extant literature with its practice of design novelties to increase methodological rigor and control for cognitive demands in narrative tasks. First, dyads reminisced about a semi-structured event, which controlled for individual differences due to memory content. Second, reminiscing was compared to the second-time narration of a storybook which rendered the two narrative contexts pragmatically more comparable. Finally, both narrative contexts utilized visual cues (story pictures, a memory photo) to elicit dyads' conversations. This procedure enhanced the comparability of the discourse structure across contexts and dyads.

There are several limitations of the current study. First, the design strengths to increase the comparability of discourse contexts might also constitute a limitation of the current study. This structured design might impair the elicitation of naturalistic mother-child conversations. Moreover, utilizing such a procedure different than the traditional and common methods leads to difficulty in comparisons and prevents the generalization of our results. Thus, future studies should replicate our findings with more or less structured narrative assessments to make generalized conclusions on mother-child discourse styles.

Second, the current study has the limitation of simultaneously considering multiple mother, child, and familial factors that might potentially contribute to maternal discourse styles and children's PT abilities. Given our results indicating the significant effects of maternal education on their discourse with a relatively homogeneous and highly-educated sample, future research should investigate the styles of Turkish mothers from different socioeconomic backgrounds to draw clear within-culture conclusions. Moreover, mothers' individual goals and functions through mother-child narratives

could possibly shape their individual patterns of talk across these conversations. Thus, it would be fruitful to examine both mothers' and children's discourse styles along with their personal opinions and aims regarding the particular narrative context. Lastly, future studies should also consider and test the effect of children's memory skills as a potential mediator since it might be related to both maternal styles and children's perspectival understanding (e.g., Lu et al., 2008; Wu & Jobson, 2019).

As an important limitation, the current study could not imply temporal or causal relations between maternal talk and children's PT. It is difficult to determine which precedes the other based on the cross-sectional results of the current study. Accordingly, it is plausible to argue either that mothers' assuming a discourse style resulted in their children's different levels of PT abilities, or that mothers adopted distinct discourse styles as a result and congruent with their children's PT competence (see Reese & Cleveland, 2006 for discussion). Therefore, longitudinal research is needed to assess the directionality of this relation.

4.4. Conclusions

The current study sheds light on the discourse features included in mother-child storytelling and reminiscing narratives, providing robust evidence for Turkish mothers' narrative roles varying between these particular contexts. In addition to contextual variances, the current study has underlined the role of maternal education, children's age, and verbal contributions in mothers' assuming the discourse styles. While considering the relations with children's perspective-taking (PT), our findings have confirmed mothers' individually and contextually unique patterns of narrative scaffolding. Children's higher visual and syntactic PT abilities were associated with the extent to which mothers' discourse is interactive depending on the narrative context. In this respect, this study has provided an impetus for cross-cultural and longitudinal investigation of different forms of mother-child daily discourse in relation to children's perspective-taking. In this sense, it has potentially contributed to future interventions and legal practices on caregiver-child daily narrative routines.

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A. DEMOGRAPHIC FORM AND LITERACY CHECK

A. Adınız ve soyadınız:

B. Yaşınız:

C. Cinsiyetiniz: ☐ Kadın ☐ Erkek

D. Çocuklarınız/çocuğunuzla olan yakınlığınız:
☐ Anne ☐ Baba

E. Kaç çocuğunuz var:
☐ 1 ☐ 2 ☐ 3 ☐ Diğer:

F. Çalışmamıza katılan çocuğunuz okul öncesi herhangi bir eğitim kurumuna gidiyor mu?

☐ Evet ☐ Hayır

Evet ise; ne kadar süredir devam ediyor? _____

G. Eğitim durumunuz nedir?

☐ Okuryazar değil
☐ İlköğretim
☐ Ortaokul
☐ Lise

☐ Üniversite
☐ Yüksek Lisans
☐ Doktora
☐ Diğer: _____

H. Eşinizin yaşı:

I. Eşinizin eğitim durumu nedir?

☐ Okuryazar değil
☐ İlköğretim
☐ Ortaokul
☐ Lise

☐ Üniversite
☐ Yüksek Lisans
☐ Doktora
☐ Diğer: _____

J. Evinizin aylık gelir düzeyini nasıl değerlendirirsiniz?

☐ Düşük ☐ Orta Seviyede ☐ İyi seviyede ☐ Çok iyi seviyede

K. Evde çocuğunuza resimli kitaplar okur musunuz?

☐ Evet
☐ Hayır

Cevabınız “evet” ise lütfen aşağıdaki soruları yanıtlamaya devam ediniz.

L. Kaç yaşından itibaren çocuğunuza hikaye kitapları okumaya başladınız?

M. Çocuğunuza ne sıklıkta hikaye kitabı okursunuz?

- ☐ Her gün
- ☐ 1-2 günde bir
- ☐ 3-4 günde bir
- ☐ Haftada bir
- ☐ Ayda bir-iki kere
- ☐ Diğer



B. REMINISCING CHECK

“Define Avı Oyunu” Üzerine Yapılan Anı Konuşmaları Hakkında Sorular

Geçen hafta araştırma birimimize geldiğinizde çocuğunuzla beraber bir “Define Avı Oyunu” oynamıştınız. Lütfen aşağıdaki soruları, yaşadığınız bu anıyı göz önüne alarak cevaplayınız.

1. Geçtiğimiz 1 hafta içerisinde siz ve çocuğunuz birlikte bu anı hakkında konuştunuz mu?

- ☐ Evet
☐ Hayır

Evet ise;

- a. Yaklaşık kaç kere konuştunuz?

- b. Siz ve çocuğunuzdan başkası/başkaları dahil oldu mu?

- ☐ Evet
☐ Hayır

Evet ise; kim/kimler dahil oldu?

- c. İkiniz bu anıyla ilgili konuşurken en çok nelerden bahsettiğinizi yazınız.

C. THE SCRIPT OF TREASURE HUNT GAME

All participants (mother-child dyads) will be having experienced this semi-structured unusual event. The event will include the same action chain for all dyads and will be identically applied.

Materials:

1. a fish-shaped jigsaw puzzle (6-piece)
2. a printed photo of the researcher with the completed puzzle
3. a treasure box including gifts for the child (fish-themed storybooks, coloring book, and crayons)
4. a living goldfish in a bowl

Protocol:

****Before participants arrive at the lab, the pieces of the puzzle are hidden in different places in the testing room as follows:**

- inside the toy box
- in the toy closet
- in the stomach of a stuffed toy (e.g., wolf)
- under the sofa cushion
- behind the sofa
- behind the door

- After preparing the room, the researcher invites each dyad to the room and says:

“Now, we will play a ‘Treasure Hunt’ game. Here is a puzzle [while she presents the puzzle and puts it on the table]. We hid some pieces of the puzzle in different places. And in this game, we will ask you and your mother to find these missing pieces in this room.”

- Then, the researcher presents the picture of the complete puzzle to the dyad and says:

“This picture shows you what the puzzle looks like before we hid the pieces. This might help you to recognize what you are searching for. You can keep it and use it as a hint.

Please don’t forget that when you find all pieces, you have to complete the puzzle together. Then, you will get a treasure box in which there are some surprises for

you. Now, you can start hunting! Please make sure you look everywhere inside the room.”

- Then, the researcher leaves the room and the dyad is given approximately 10 minutes to complete the game. If it takes a lot of time (more than 10 minutes), the researcher gets into the room and gives them some hints about the dyad.
- When the game is over, the researcher comes into the room with the treasure box and presents them with each gift inside the box.
- After the treasure box, the researcher brings our lab’s live-in resident, a goldfish named ‘Kraker’ and introduces him to the dyad by saying:

“Look at this! This is my fish friend. Do you want to meet my pet fish? His name is ‘Kraker’. Kraker wakes up very early in the morning and has some breakfast just like us! Did you know that? Then, it swims all day long. As soon as I arrive at my office, I say “hi” to my fish and ask him “How are you today?”. Of course, Kraker cannot talk to me, but still, I like talking to Kraker. Now, do you wanna introduce yourself to Kraker, so that he may remember you next time!”

- Following the introduction of Kraker, the researcher takes a souvenir photo of the dyad with game materials on the table (e.g., the treasure box, gifts, Kraker the fish). The researcher keeps the photo and prints it on before visiting the dyad at their home. The printed photo is presented to the dyad and used as a memory cue for their reminiscing about the “treasure hunt” game.

D. DETAILED CODING SCHEME FOR MATERNAL DISCOURSE STYLES IN NARRATIVES

Discourse feature	Coding subcategory	Definition	Examples	
			Storytelling	Reminiscing
1-Elaboration requests		Questions that mothers ask their children for elaborations (i.e., pieces of new information or personal evaluation) pertaining to the storybook or memory.		
	<i>Open-ended questions</i>	Elaboration questions that require children to give an answer beyond yes/no or forced choice.	Where do you think the frog went?	What did we do first in this room?
	<i>Closed-ended questions</i>	Elaboration questions that require children to give a yes/no answer (for yes/no questions) or an answer from provided options (for forced-choice questions).	Will the boy go to the forest now?	Did we look behind the door or under the pillow?
	<i>Fill-in-the-blank requests</i>	Utterances that mothers provide all but only a missing piece of elaboration and then allow children to supply this information.	M: <u>And then he saw a...?</u> C: An owl.	M: Did we find a piece in that box? C: No. M: <u>But we found under what?</u>
	<i>Memory prompts</i>	Questions or statements that mothers ask children for a number of elaborations without providing any specific details.	Tell me more about this boy.	What do you remember from that day?
2-Elaboration provisions		Statements or tag questions that mothers provide elaborations for children.	C: And then they got caught? M: No. M: <u>They got out of there fast.</u>	You were very happy to us complete the puzzle, weren't you?

Discourse feature	Coding subcategory	Definition	Examples	
			Storytelling	Reminiscing
3- Conversational talk		Utterances that do not provide or ask for narrative elaborations, but indicate mothers' attempts to contribute to the flow of the conversation.		
	<i>Evaluations</i>	Utterances that mothers confirm or negate children's previous response.	C: Look, a squirrel! M: <u>Yes.</u> C: He is running away from the hole. M: <u>No, not like that.</u> M: He just lives there.	M: Where did we find the last piece of the puzzle? C: Under the couch? M: <u>No.</u> M: It was inside a toy. C: The wolf! M: <u>You're right.</u>
	<i>Conversational repetitions</i>	Utterances that mothers fully or partially repeat the children's previous response for evaluation purposes.	M: Where did the boy first look at? C: Under his bed. M: <u>He looked under the bed, didn't he?</u>	C: I found the last piece of the puzzle, not you. M: You found it, got it.
	<i>Clarifications</i>	Questions that mothers ask for acoustical clarification.	C: The boy was scared (whisperingly) M: The boy what?	C: They took umm... our pic- (under breath) M: Can you repeat loudly what they took?
	<i>Back-channeling</i>	Vocal feedback that mothers provide children to show that she follows what the child talks about.	C: The deer then jumped, and- M: Uh-huh? C: They fell off a cliff.	C: We kept looking for the pieces everywhere around the room. M: Mmhm. C: Then, we found every piece.
	<i>Attention moderators/story fillers</i>	Utterances that mothers use to call for children's attention or as fillers for the flow of the narrative event.	M: Then, they saw someone. M: <u>A-ha, let's see what happened next!</u>	M: <u>Oh my gosh, look at that!</u> C: "Cracker" the fish!

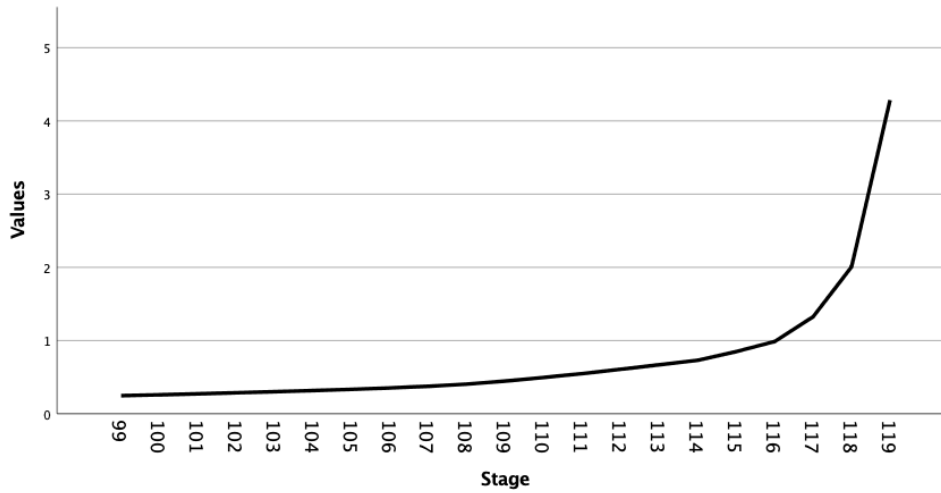
Discourse feature	Coding subcategory	Definition	Examples	
			Storytelling	Reminiscing
4-Repetitions		Questions or statements that mothers repeat the gist or the exact content of their own previous utterance containing elaboration.	M: Look, the frog is hiding under the bushes. M: <u>He is hiding, isn't he?</u>	M: What was the color of the fish? M: <u>Do you remember the color of the fish?</u>
5-Non-narrative related talk	<i>Future inferences</i>	Utterances that mothers make inferences for future based on the content under the discussion.	M: The dog broke the jar, didn't he? C: Uh-huh. M: <u>Then they should be more careful next time.</u>	C: Mommy, I had so much fun that day. M: Me too honey. M: <u>I think we should go back to that school sometime.</u>
	<i>Fantasy talk</i>	Utterances that contain fictional/imaginary expressions away from factual expressions based on the narrative content.	If you had a frog, what would you name it?	Do you think if you played the game again, you would complete the puzzle faster?
	<i>General knowledge</i>	Utterances that mothers provide to or ask from children about general world knowledge based on the narrative content.	M: The frog jumped all over the cliff. M: <u>Did you know frogs can jump very high?</u>	C: Mommy, the fish was so wet, wasn't it? M: Yes. M: Where do fish live honey?
	<i>Personal experience</i>	Utterances that mothers talk about their past experiences based on the narrative content.	Do you remember your uncle also had such a lovely dog?	Umm, you and I used to play a game like this, remember?
	<i>Meta-literacy comments</i>	Utterances about the book reading activity itself.	Look, the author was Mercer Mayer.	-
	<i>Meta-narrative comments</i>	Utterances about the narrative activity itself.	This was a happy ending story, too.	Let's talk about that day.
	<i>Meta-memory comments</i>	Utterances about the remembering activity itself.	I don't remember this book, do you?	Oh, I forgot the details.

Discourse feature	Coding subcategory	Definition	Examples	
			Storytelling	Reminiscing
6-Nonnarrative unrelated talk		Utterances that have neither direct nor indirect relation to the content of the book or event.	C: I'm so bored mom! M: Okay, it's almost over.	M: Is your nose runny? M: Let's clean it up.
7-Other talk		Utterances that are unclassifiable, unintelligible, and incomplete, also include paralinguistic and nonverbal expressions.	M: How did the dog yell? C: You tell. M: <u>Woof woof woof!</u>	M: <u>I think they all rol-</u> C: They all rolled down. M: Yes honey.

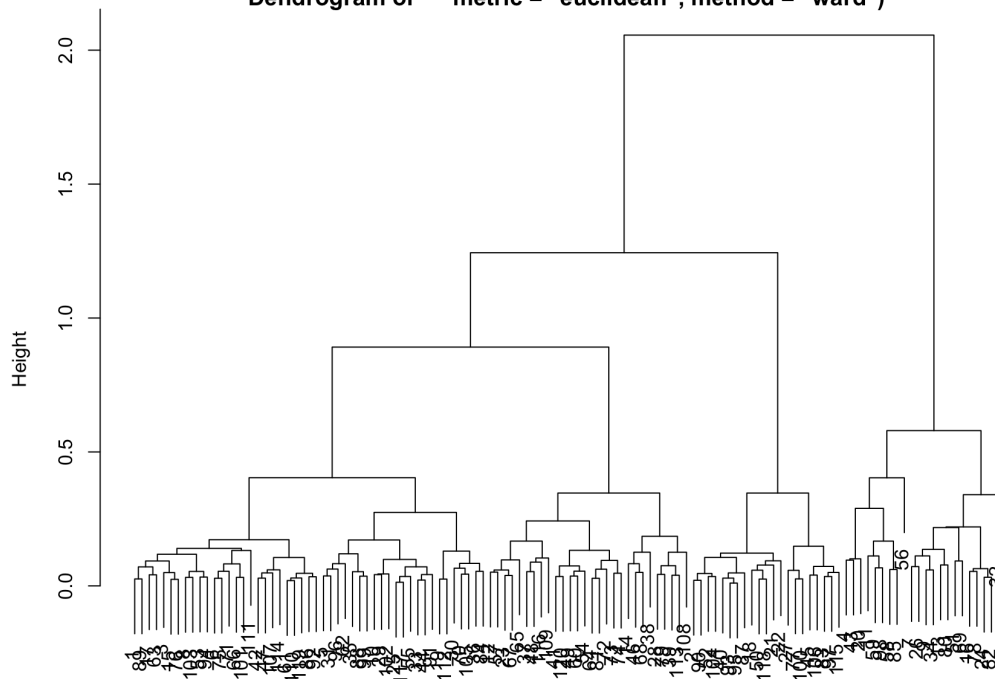
E. CLUSTERING PROCEDURE AND OUTPUTS

E1. Storytelling Cluster Analyses

Agglomeration Schedule
Coefficients

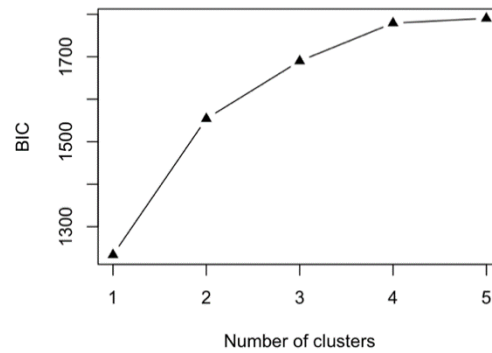
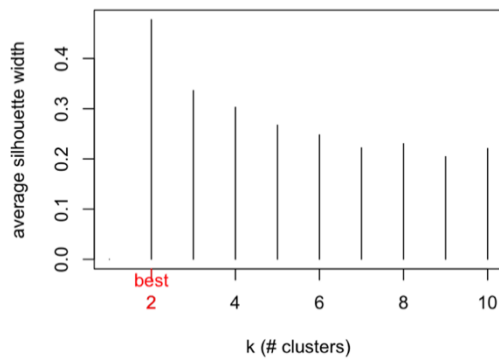


Dendrogram of `agnes(x = (subset(ElifDataforRclustering, select = c(TotalNarrElabRequest_PropFrog, TotalNarrElabProv_PropFrog, TotalNarrRepetTalk_PropFrog, TotalNarrConverTalk_PropFrog, TotalNonNarrRelaTalk_PropFrog))), metric = "euclidean", method = "ward")`



`(subset(ElifDataforRclustering, select = c(TotalNarrElabRequest_PropFrog, TotalNarrElabProv_PropFrog, TotalNarrRepetTalk_PropFrog, TotalNarrConverTalk_PropFrog, TotalNonNarrRelaTalk_PropFrog)))`

pam() clustering assessment



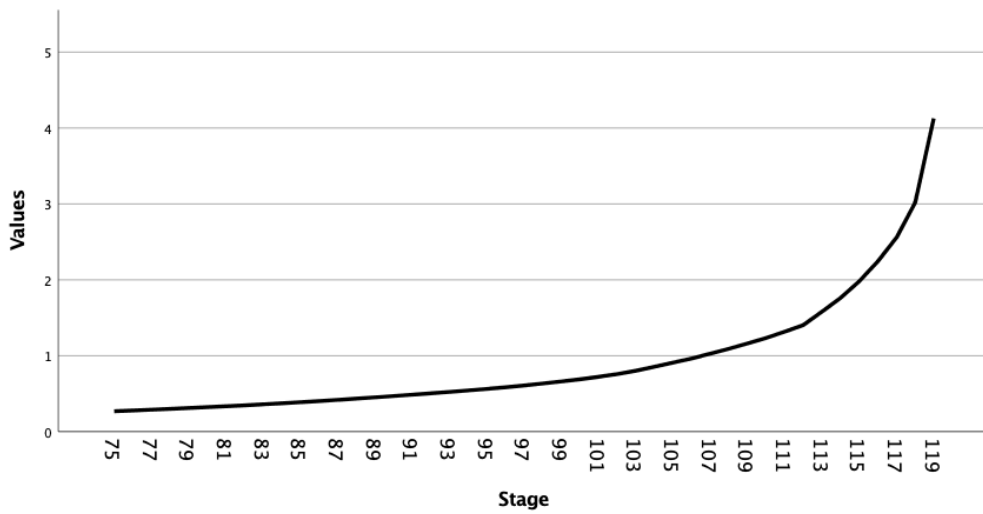
Index	Number of clusters	Index Value
KL	5	3.345
CH	4	126.883
Hartigan	4	23.056
CCC	2	22.332
Scott	3	86.026
Marriot	4	-0.0001
TrCovW	3	0.482
TraceW	3	0.376
Friedman	3	45.742
Rubin	4	-4.741
Cindex	4	0.197
DB	2	0.808
Silhouette	2	0.494
Duda	4	0.637
PseudoT2	4	11.404
Beale	4	1.6996
Ratkowsky	3	0.335
Ball	3	0.6198
PtBiserial	2	0.631
Frey	3	1.265
McClain	2	0.197
Dunn	5	0.094
Hubert	0	0
Sdindex	2	13.637
Dindex	0	0
SDBw	5	0.39

Among all indices:

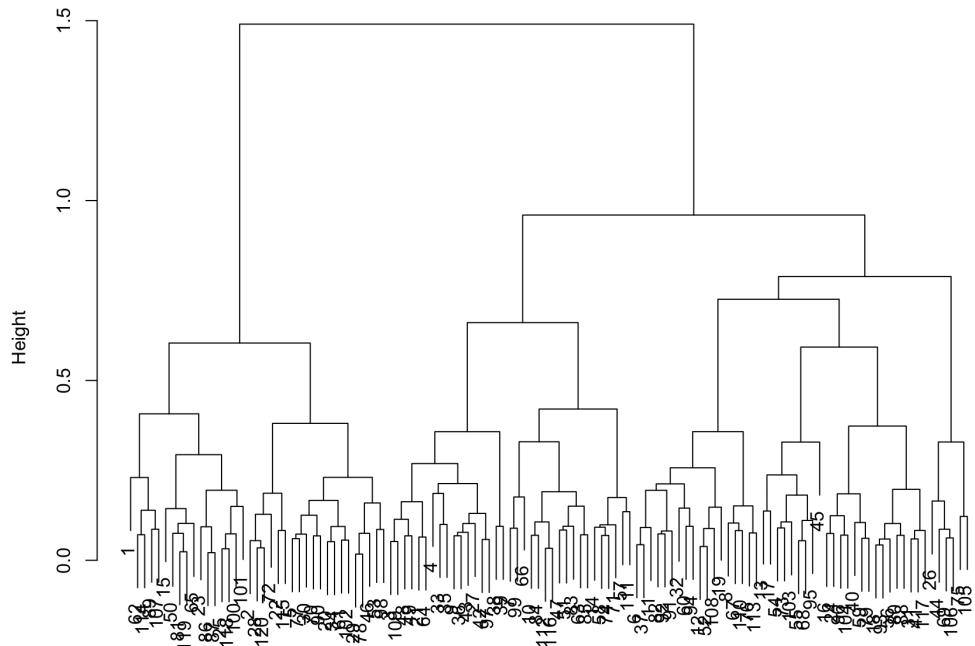
- * 6 proposed 2 as the best number of clusters
- * 7 proposed 3 as the best number of clusters
- * 8 proposed 4 as the best number of clusters
- * 3 proposed 5 as the best number of clusters

E2. Reminiscing Cluster Analyses

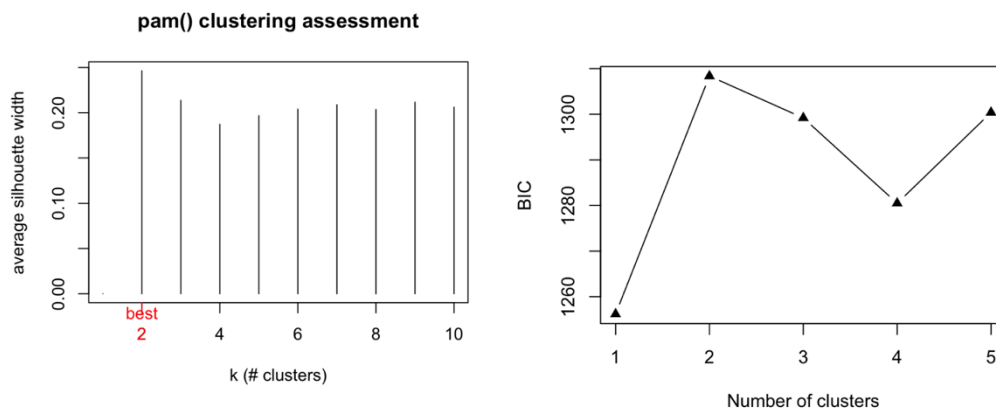
Agglomeration Schedule
Coefficients



Dendrogram of `agnes(x = (subset(ElifDataforRclustering, select = c(TotalNarrElabRequest_PropR
rogram of TotalNarrElabProv_PropRem, TotalNarrRepetTalk_PropRem, TotalNarrConverTalk_P
Dendrogram of TotalNonNarrRelaTalk_PropRem))), metric = "euclidean", method = "ward")`



`(subset(ElifDataforRclustering, select = c(TotalNarrElabRequest_PropRem,
TotalNarrElabProv_PropRem, TotalNarrRepetTalk_PropRem, TotalNarrConverTalk_PropRem,
TotalNarrRelaTalk_PropRem)))`



Index	Number of clusters	Index Value
KL	2	10.502
CH	2	43.458
Hartigan	3	5.043
CCC	2	14.872
Scott	3	103.757
Marriot	3	0.023
TrCovW	3	0.13
TraceW	3	0.149
Friedman	3	15.823
Rubin	3	-0.155
Cindex	3	0.281
DB	5	1.378
Silhouette	2	0.231
Duda	2	0.81
PseudoT2	2	19.009
Beale	2	0.726
Ratkowsky	3	0.282
Ball	3	0.656
PtBiserial	5	0.414
Frey	1	NA
McClain	2	0.586
Dunn	5	0.13
Hubert	0	0
Sdindex	5	15.31
Dindex	0	0
SDbw	5	0.653

Among all indices:

- * 8 proposed 2 as the best number of clusters
- * 10 proposed 3 as the best number of clusters
- * 5 proposed 5 as the best number of clusters

F. ETHICAL APPROVAL



Bilkent Üniversitesi

Akademik İşler Rektör Yardımcılığı

Tarih: 12 Ekim 2018

Gönderilen: Elif Bürümlü Kısa

Gönderen: Fatma Taşkın
İnsan Araştırmaları Etik Kurulu Başkanı

Konu: "The Effects of ..." çalışması etik kurul onayı.

Üniversitemiz İnsan Araştırmaları Etik Kurulu, 12 Ekim 2018 tarihli görüşme sonucu, "The Effects of Parental Discourse during the Parent-Child Event Experience on Children's Autobiographical Memory Development" isimli çalışmanız kapsamında yapmayı önerdiğiniz etkinlik için etik onay vermiş bulunmaktadır. Onay, ekte verilmiş olan çalışma önerisi, çalışma yürütücüleri, ve bilgilendirme formu için geçerlidir.

Bu onay, yapmayı önerdiğiniz çalışmanın genel bilim etiği açısından bir değerlendirmesine karşı gelmektedir. Çalışmanızda, kurumumuzun değerlendirmesi dışında kalabilen özel etik ve yasal sınırlamalara uymakla ayrıca yükümlüsünüz.

Etik Kurul Üyeleri:

Ünvan / İsim	Bölüm / Uzmanlık	İmza
1. Doç.Dr. Fatma Taşkın	İktisat	
2. Prof.Dr. Erdal Onar	Hukuk	
3. Prof.Dr. Haldun Özaktaş	Elektrik ve Elektronik Müh.	
4. Doç.Dr. Işık Yuluğ	Moleküler Biyoloji ve Genetik	
5. Yrd.Doç.Dr. Gül Günaydın	Psikoloji	
Yd.1.Doç.Dr. Çiğdem Gündüz Demir	Bilgisayar Mühendisliği	
Yd.2. Yrd.Doç.Dr. A.Bariş Özbilen	Hukuk	

Kurul karar/toplantı No: 2018_10_12_04